Korenix JetNet 5010G Series
Industrial Managed Ethernet Switch

User Manual

Ver. 2.8, Jun,2011

Firmware v2.4b

korenix

www.korenix.com

Korenix JetNet 5010G Series
Industrial Managed Ethernet Switch
User's Manual

Copyright Notice

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

Index

1 Introduction

Welcome to Korenix *JetNet 5010G* Series Industrial Managed Ethernet Switch User Manual. Following topics are covered in this chapter:

1.1 Overview

1.2 Major Features

1.3 Package Checklist

1.1 Overview

JetNet 5010G series, Industrial 10-port Managed Ethernet Switches, have 7 10/100Base-TX ports and 3 combo ports, respectively 10/100/1000 RJ-45 / 100-FX / Gigabit SX/LX. *JetNet 5010G* is especially designed to operate under harsh environmental conditions. The switches provide solid foundation for a highly fault-tolerant and easily-managed network. JetNet 5010G can be remotely configured by Telnet, Web browser, JetView and managed by Simple Network Management Protocol (SNMP) and Remote Monitoring (RMON). You can also connect the attached RS232 console cable to manage the switch by Command Line Interface (CLI). CLI commands are Cisco-Like commands, your engineers who are familiar with Cisco products don’t need to learn new rules for CLI commands.

Security is enhanced with advanced features such as 802.1Q VLAN and Port/IP security. Performance is optimized by QoS and IGMP Snooping/Query. Korenix 3nd generation Ring technology, Multiple Super Ring, enables superb self-healing capability for network failure. The fastest failover time is enhanced from 300ms to 5ms for 10/100TX RJ-45 ports, and 30ms for 100FX and Gigabit Fiber. This is Korenix patented ring technology, which is registered in most countries. For interoperability with your existed network, JetNet 5010G series also come with an advanced redundant network solution, Ring Coupling and Rapid Dual Homing technology. With Ring Coupling and Rapid Dual Homing technology, Ethernet Ring can be extended more easily. No matter with Korenix switch or other managed switches.

The IP31-design aluminum case further strengthens JetNet 5010G's withstand ability in harsh industrial environment. The event warning is notified to the network administrator via e-mail, system log, or to field engineers by relay output. JetNet 5010G Series Industrial Managed Ethernet Switch has also passed CE/ FCC/ UL safety certifications to help ensure safe and reliable data transmission for industrial applications. JetNet 5010G Series will be your best option for highly-managed industrial network.

1.2 Major Features

Korenix JetNet 5010G Series products have the following features:

- SFP ports support 100/1000 Fiber with Digital Diagnostic Monitoring (DDM) to monitor long distance fiber quality

- Multiple Super Ring (recovery time <5ms), Rapid Dual Homing, Multiple Ring, and MSTP/RSTP
- VLAN, Private VLAN, QinQ, GVRP, QoS, IGMP Snooping V1/V2/V3, Rate Control, Port Trunking, LACP, Online Multi-Port Mirroring
- 32Gbps Non-Blocking, switch backplane 8K MAC address table
- Supports LLDP and JetViewPro i2NMS software for auto topology visualization and efficient group management
- Supports console CLI , Web, SNMP V1/V2c/V3, RMON, HTTPS, SSH for remote management
- Advanced security feature supports IP Security, Port Security,
- DHCP Server, IP and MAC Binding, 802.1x network access control
- Event Notification by E-mail, SNMP trap, Syslog, Digital Input and Relay Output
- Dual 12-48VDC power inputs.
- IP31 rugged aluminum case
- Operating temperature -25~70^{o}C for JetNet 5010G, -40~70^{o}C for JetNet 5010G-w

Note: The detail spec is listed in Appendix 5.1.

1.3 Package List

Korenix JetNet 5010G Series products are shipped with following items:

- One industrial Managed Ethernet switch
- One DIN-Rail clip (attached to the switch)
- One wall mounting plate and 4 screws (M3 in 6 mm length)
- One RS-232 DB-9 to RJ-45 console cable
- Documentation and Software CD
- Quick Installation Guide

If any of the above items are missing or damaged, please contact your local sales representative.

2 Hardware Installation

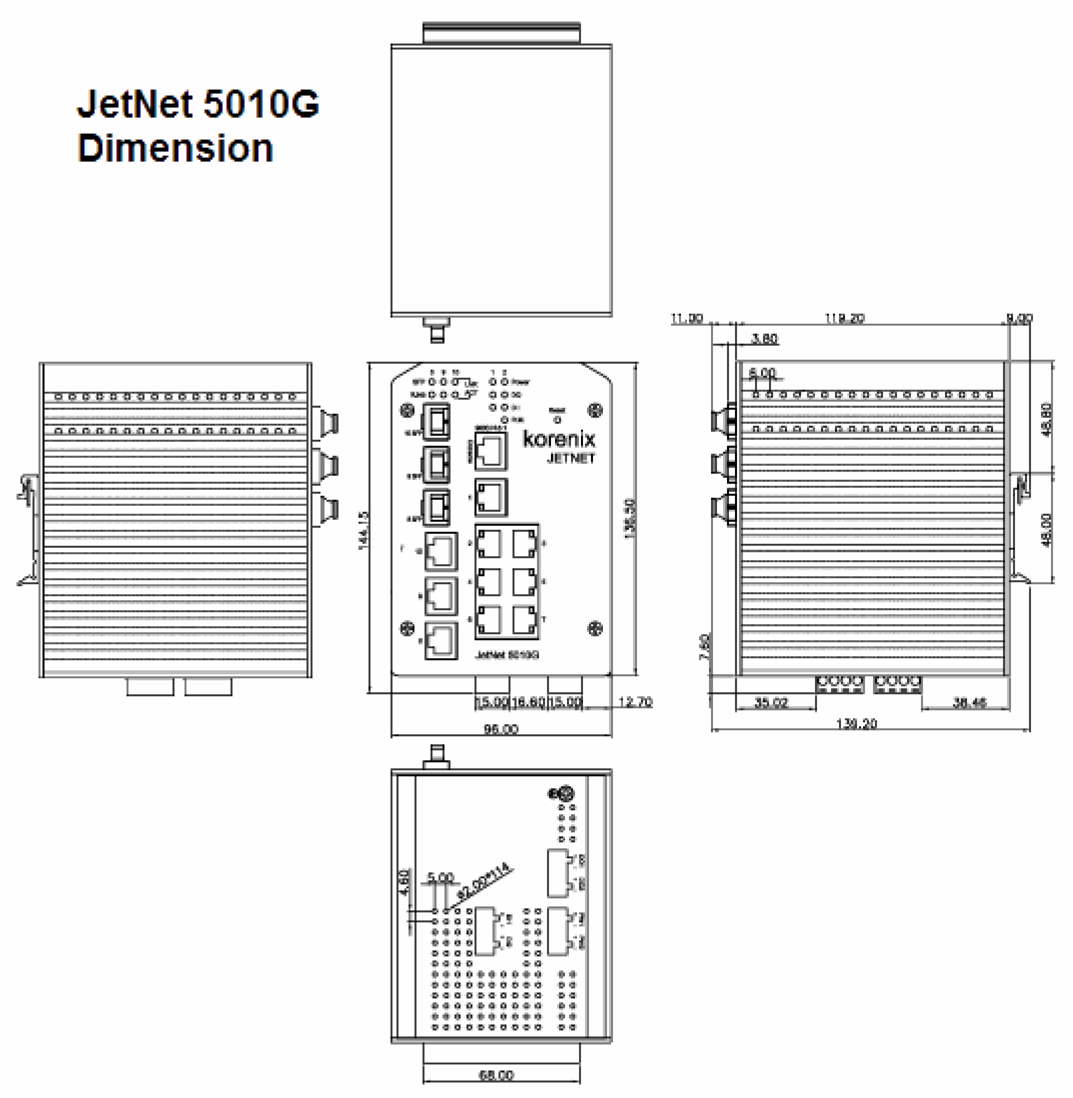
This chapter includes hardware introduction, installation and configuration information.

Following topics are covered in this chapter:

2.1 Hardware Introduction

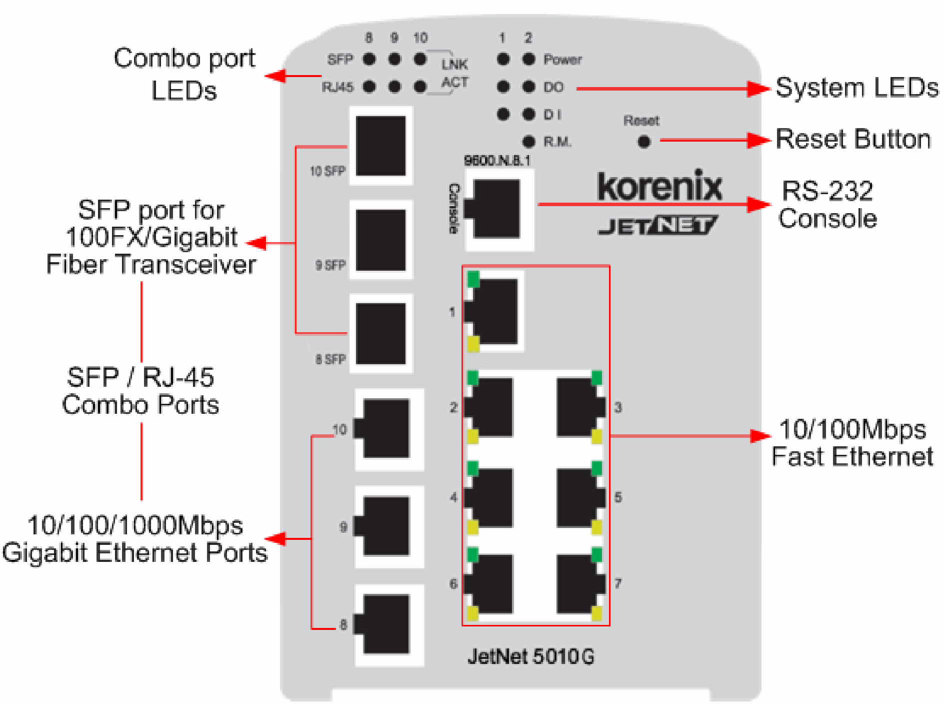
Dimension

JetNet 5010G Industrial Gigabit Switch dimension (W x H x D) is **96mm x 137mm x 119mm**



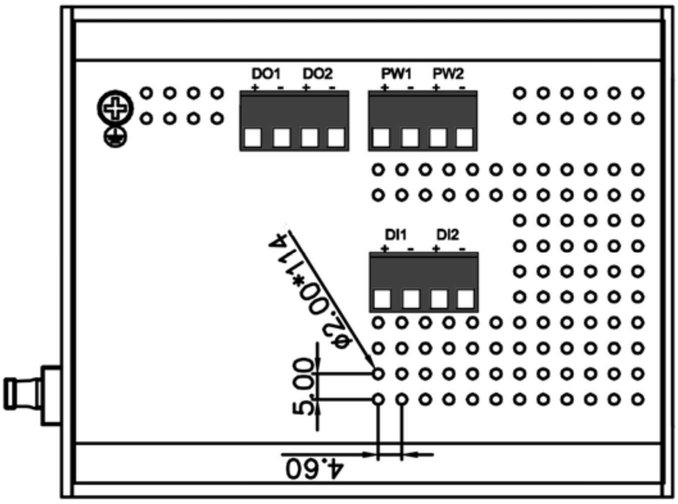
Panel Layout

The front panel includes 10/100Mbps Fast Ethernet ports, Gigabit Ethernet ports, SFP slot, RS232 console port, System / Combo Port LED and Reset button.



Bottom View

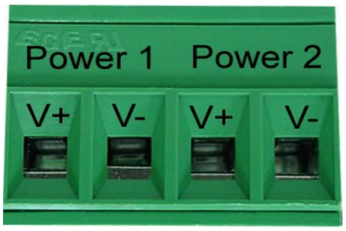
The bottom view of the JetNet 5010G Industrial Gigabit Managed Switch consists of three terminal block connectors with two DC power inputs, two Digital Inputs, 2 Relay Outputs and 1 Earth Ground.



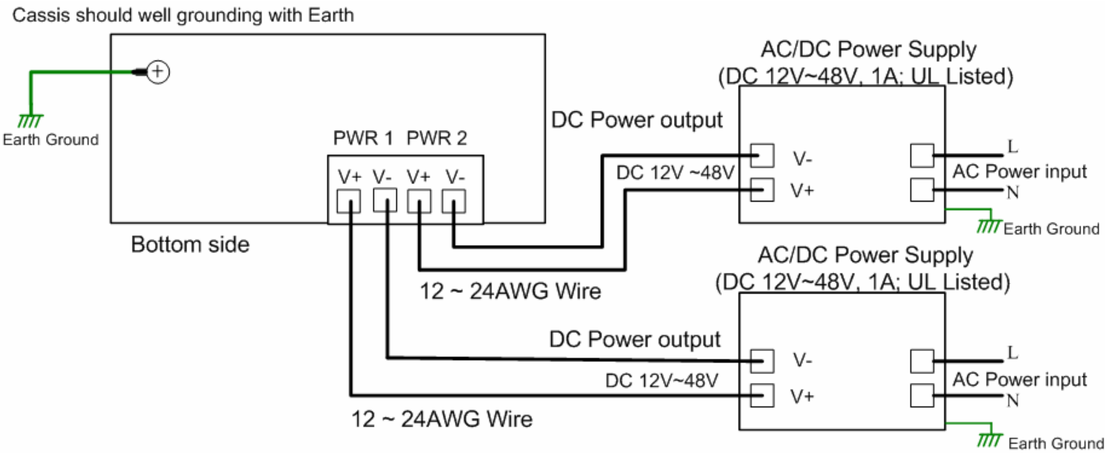
> Note: The unit intended to use vertical direction, with DIN-rail or wall-mount only.

2.2 Wiring Power Inputs

Follow below steps to wire JetNet 5010G redundant DC power inputs.



1. Insert positive and negative wires into V+ and V- contacts respectively of the terminal block connector
2. Tighten the wire-clamp screws to prevent DC wires from being loosened.
3. Power 1 and Power 2 support power redundancy and polarity reverse protection functions.
4. Positive and negative power system inputs are both accepted, but Power 1 and Power 2 must apply the same mode.



Note 1: It is a good practice to turn off input and load power, and to unplug power terminal block before making wire connections. Otherwise, your screwdriver blade can inadvertently short your terminal connections to the grounded enclosure.

Note 2: The range of the suitable electric wire is from 12 to 24 AWG.

Note 3: If the 2 power inputs are connected, JetNet 5010G will be powered from the highest connected voltage. The unit will alarm for loss of power, either PWR1 or PWR2.

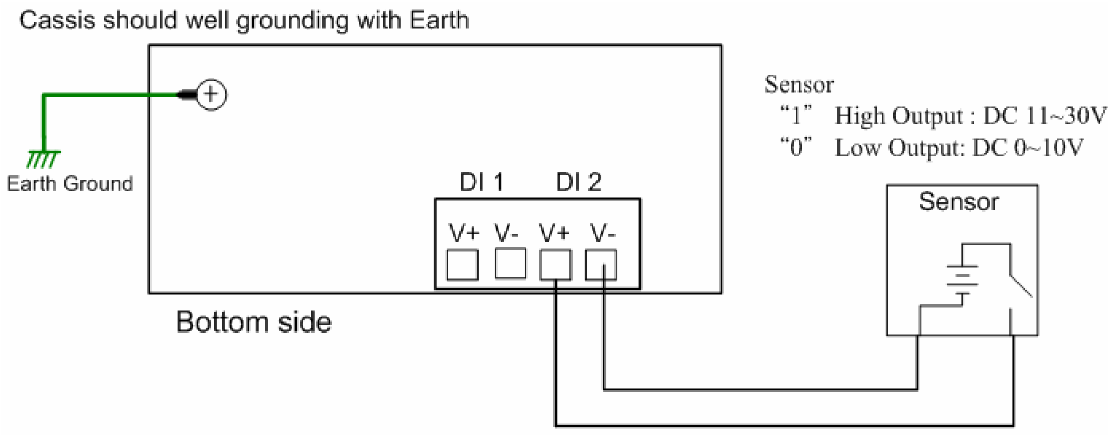
Note 4: To use the UL Listed **LPS** power supply with output Rating 12-48 Vdc, minimum 1 A

2.3 Wiring Digital Input

JetNet 5010G provides 2 digital inputs. It allows users to connect the termination units' digital output and manage/monitor the status of the connected unit. The Digital Input pin can be pulled high or low; thus the connected equipments can actively drive these pins high or low. The embedded software UI allows you to read and set the value to the connected device.

The power input voltage of logic low is DC 0~10V. Logic high is DC 11~30V.

Wire the digital input just like wiring the power input introduced in chapter 2.2.

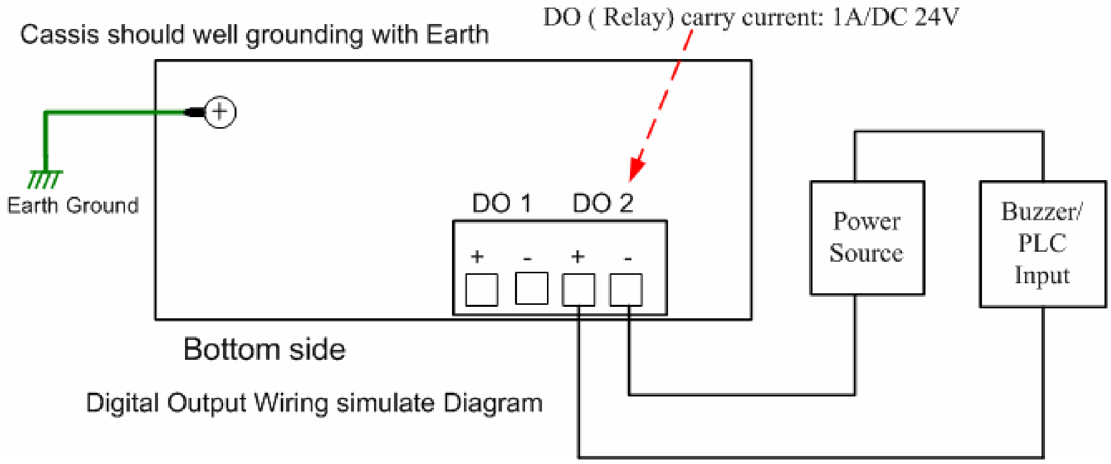


Digital Input Wiring simulate Diagram

2.4 Wiring Digital Output

JetNet 5010G provides 2 digital outputs, also known as Relay Output. The relay contacts are energized (open) for normal operation and will close for fault conditions. The fault conditions include power failure, Ethernet port link break or other pre-defined events which can be configured in JetNet 5010G UI.

Wiring digital output is exactly the same as wiring power input introduced in chapter 2.2.

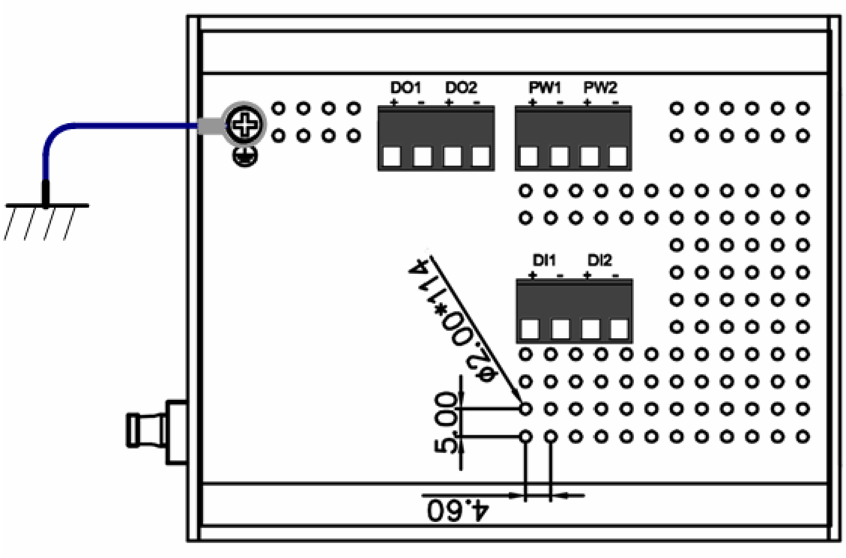

DO (Relay) carry current: 1A/DC 24V
Cassis should well grounding with Earth
Earth Ground
DO 1
DO 2
+
-
+
-
Bottom side
Power Source
Buzzer/ PLC Input

Digital Output Wiring simulate Diagram

2.5 Wiring Earth Ground

To ensure the system will not be damaged by noise or any electrical shock, we suggest you to make exact connection with JetNet 5010G with Earth Ground.

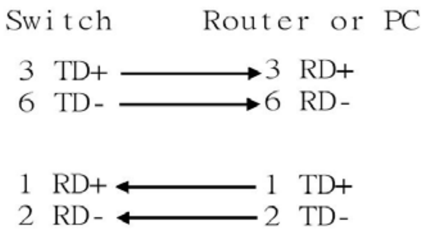
On the bottom side of JetNet 5010G, there is one earth ground screw. Loosen the earth ground screw by screw drive; then tighten the screw after earth ground wire is connected.



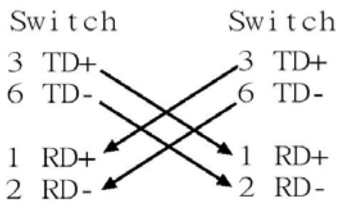
2.6 Wiring Fast Ethernet Ports

JetNet 5010G includes 7 RJ-45 Fast Ethernet ports. The fast Ethernet ports support 10Base-T and 100Base-TX, full or half duplex modes. All the fast Ethernet ports will auto-detect the signal from connected devices to negotiate the link speed and duplex mode. Auto MDI/MDIX allows users to connect another switch, hub or workstation without changing straight through or crossover cables.

Note that crossover cables simply cross-connect the transmit lines at each end to the received lines at the opposite end.



Straight-through Cabling Schematic



Cross-over Cabling Schematic

Note that Ethernet cables use pins 1, 2, 3, and 6 of an 8-pin RJ-45 connector. The signals of these pins are converted by the automatic MDI-X function, as shown in the table below:

Pin MDI-X	Signals	MDI Signals
1	RD+	TD+
2	RD-	TD-
3	TD+	RD+
6	TD-	RD-

Connect one side of an Ethernet cable into any switch port and connect the other side to your attached device. The LNK LED will light up when the cable is correctly connected. Refer to the **LED Indicators** section for descriptions of each LED indicator. Always make sure that the cables between the switches and attached devices (e.g. switch, hub, or workstation) are less than 100 meters (328 feet).

The wiring cable types are as below.

10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable, EIA/TIA-568 100-ohm (100m)

100 Base-TX: 2-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)

1000 Base-TX: 4-pair UTP/STP Cat. 5 cable, EIA/TIA-568 100-ohm (100m)

2.7 Wiring Combo Ports

JetNet 5010G includes 3 RJ-45 Gigabit Ethernet ports. The speed of the gigabit Ethernet port supports 10Base-T, 100Base-TX and 1000Base-TX. JetNet 5010G also equips 3 gigabit SFP ports combo with gigabit Ethernet ports. The speed of the SFP port supports 100Base-FX and 1000Base-SX/LX. The SFP ports accept standard MINI GBIC SFP transceiver. But, to ensure system reliability, Korenix recommends using the Korenix certificated Gigabit SFP Transceiver. The certificated SFP transceiver includes 100Base-FX single/multi mode, 1000Base-SX/LX single/multi mode ranger from 550m to 80KM.

To keep best performance, the SFP fiber ports will not support Fiber Link First function anymore after firmware version v2.4b, since the SFP fiber transceiver vendor have applied energy saving technology and changed the circuit design that will cause SFP transceiver can't offer energy of fiber link signature to switches the connection from RJ-45 to fiber, even the SFP fiber transceiver already link up.

To fix that issue, new v2.4b firmware have applied plug-in and switch to fiber mode feature. It forced the connection change from RJ-45 to SFP immediately, once the SFP transceiver inserted and detected by CPU.

Note: The Ethernet Switch has to use UL recognized fiber transceiver with Class 1 Laser/LED Diode.

Note: It is recommended don't plug-in SFP fiber transceiver and link up RJ-45 port at same time, it might cause the connection does not work properly, especially the Switch's firmware version before V2.4b.

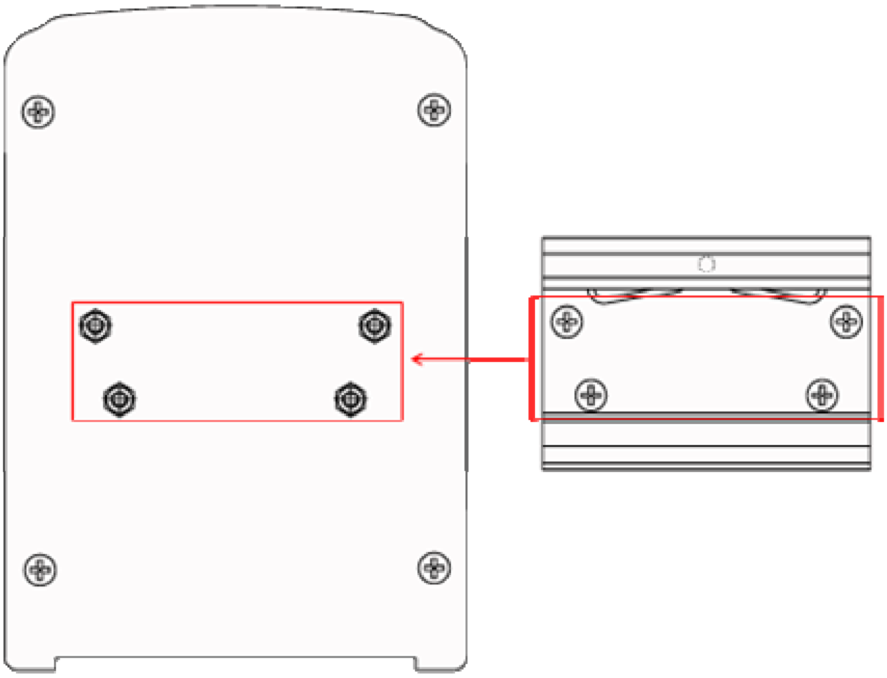
2.8 Wiring RS-232 Console Cable

Korenix attaches one RS-232 DB-9 to RJ-45 cable in the box. Connect the DB-9 connector to the COM port of your PC, open Terminal tool and set up serial settings to 9600, N,8,1. (Baud Rate: 9600 / Parity: None / Data Bit: 8 / Stop Bit: 1) Then you can access CLI interface by console able.

Note: If you lost the cable, please contact with your sales or follow the pin assignment to buy a new one. The Pin assignment spec is listed in the appendix.

2.9 DIN-Rail Mounting Installation

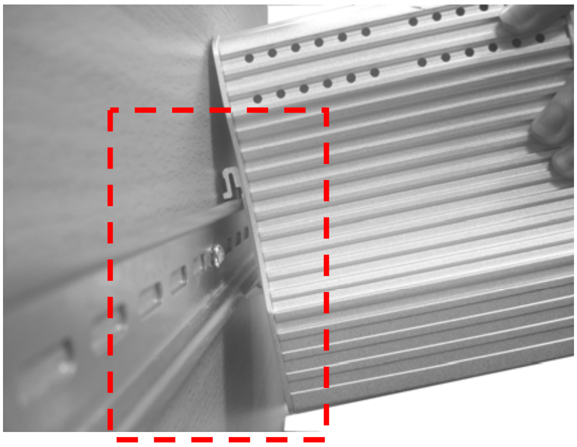
The DIN-Rail clip is already attached to the JetNet 5010G when packaged. If the DIN-Rail clip is not screwed on the JetNet 5010G, follow the instructions and the figure below to attach DIN-Rail clip to JetNet 5010G.



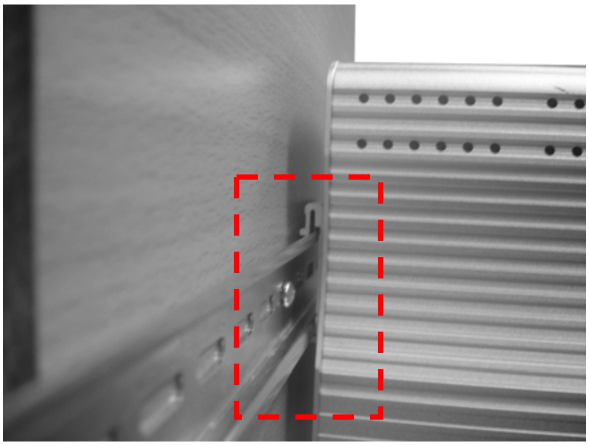
1. Use the screws to attach DIN-Rail clip to the real panel of JetNet5010G.
2. To remove DIN-Rail clip, reverse step 1.

Follow the steps below to mount JetNet 5010G to the DIN-Rail track:

1. First, insert the upper end of DIN-Rail clip into the back of DIN-Rail track from its upper side.



2. Lightly push the bottom of DIN-Rail clip into the track.



3. Check if DIN-Rail clip is tightly attached on the track.
4. To remove JetNet 5010G from the track, reverse the steps above.

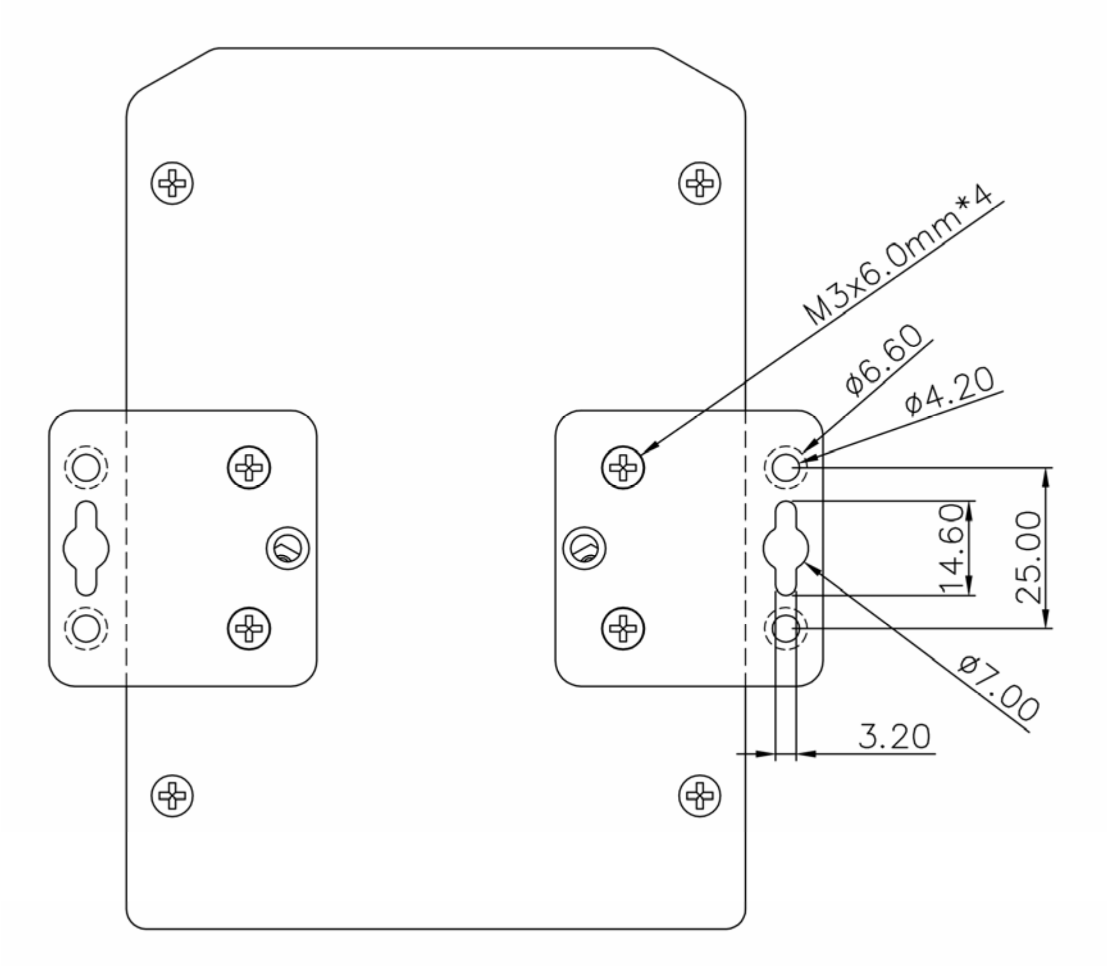
Notes: The DIN Rail should compliance with DIN EN50022 standard. Using wrong DIN rail may cause system install unsafe.

2.10 Wall-Mounting Installation

Follow the steps below to install JetNet 5010G with the wall mounting plate.

1. To remove DIN-Rail clip from JetNet 5010G, loosen the screws from DIN-Rail clip.
2. Place the wall mounting plate on the rear panel of JetNet 5010G.
3. Use the screws to tighten the wall mounting plate onto JetNet 5010G.
4. Use the hook holes at the corners of the wall mounting plate to hang JetNet 5010G onto the wall.
5. To remove the wall mounting plate, reverse the steps above.

Mounting plate and screws.



Note: To avoid damage the internal circuit, be sure use the screw included in the package to screw and tight the wall-mount kit onto the rear side of the JetNet switch. The specification of screw is M3 in 6 mm length.

3 Preparation for Management

JetNet 5010G series Industrial Managed Switch provides both in-band and out-band configuration methods. You can configure the switch via RS232 console cable if you don't attach your admin PC to your network, or if you lose network connection to your JetNet 5010G. This is so-called out-band management. It wouldn't be affected by network performance.

The in-band management means you can remotely manage the switch via the network. You can choose Telnet or Web-based management. You just need to know the device's IP address and you can remotely connect to its embedded HTTP web pages or Telnet console.

Following topics are covered in this chapter:

3.1 Preparation for Serial Console

In JetNet 5010G package, Korenix attached one RS-232 DB-9 to RJ-45 console cable. Please attach RS-232 DB-9 connector to your PC COM port, connect RJ-45 to the Console port of the JetNet 5010G. If you lose the cable, please follow the console cable PIN assignment to find one. (Refer to the appendix).

1. Go to Start -> Program -> Accessories -> Communication -> Hyper Terminal
2. Give a name to the new console connection.
3. Choose the COM name
4. Select correct serial settings. The serial settings of JetNet 5010G are as below:

   Baud Rate: 9600 / Parity: None / Data Bit: 8 / Stop Bit: 1
5. After connected, you can see Switch login request.
6. Login the switch. The default username is "admin", password, "admin".

```
Booting...
          Sun Jan   1 00:00:00 UTC 2006


Switch login: admin
Password:


JetNet5010G (version 2.1.5-20080414-11:04:13).
Copyright 2006-2008 Korenix Technology Co., Ltd.

Switch>
```

3.2 Preparation for Web Interface

JetNet 5010G provides HTTP Web Interface and Secured HTTPS Web Interface for web management.

3.2.1 Web Interface

Korenix web management page is developed by JAVA. It allows you to use a standard web-browser such as Microsoft Internet Explorer, or Mozila, to configure and interrogate the switch from anywhere on the network.

Before you attempt to use the embedded web interface to manage switch operation, verify that your JetNet 5010G Series Industrial Ethernet Switch is properly installed on your network and that every PC on this network can access the switch via the web browser.

1. Verify that your network interface card (NIC) is operational, and that your operating system supports TCP/IP protocol.

2. Wire DC power to the switch and connect your switch to your computer.

3. Make sure that the switch default IP address is 192.168.10.1.

4. Change your computer IP address to 192.168.10.2 or other IP address which is located in the 192.168.10.x (Network Mask: 255.255.255.0) subnet.

5. Switch to DOS command mode and ping 192.168.10.1 to verify a normal response time.

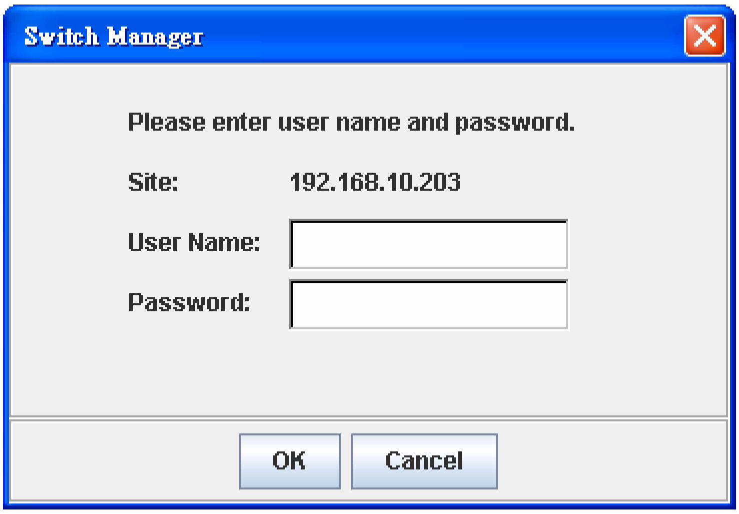
Launch the web browser and Login.

6. Launch the web browser (Internet Explorer or Mozila Firefox) on the PC.

7. Type **http://192.168.10.1** (or the IP address of the switch). And then press **Enter**.

8. The login screen will appear next.

9. Key in user name and the password. Default user name and password are both **admin**.



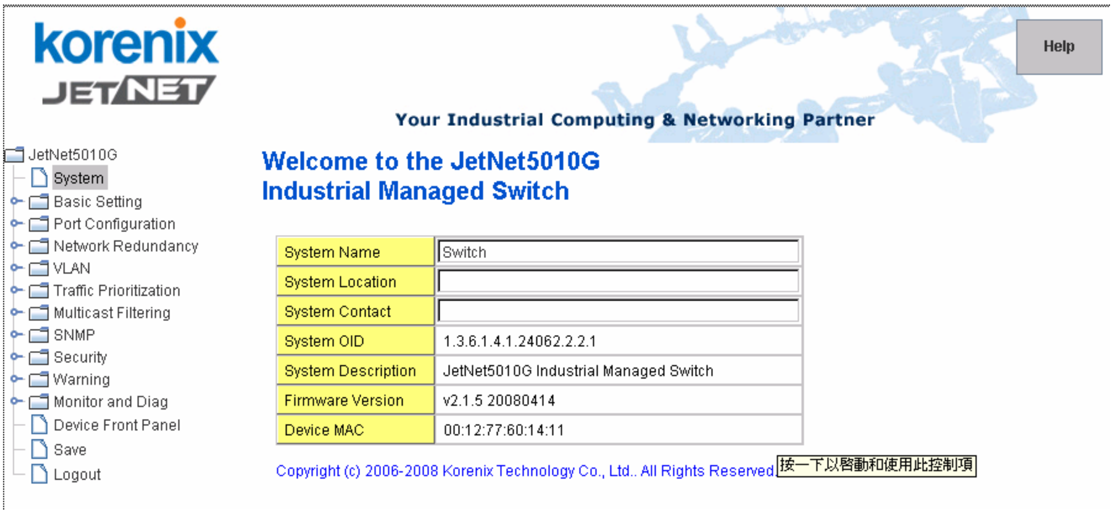
Please enter user name and password.

Site: 192.168.10.203

User Name:

Password:

Click on **Enter** or **OK**. Welcome page of the web-based management interface will then appear.



Welcome to the JetNet5010G
Industrial Managed Switch

System Name	Switch
System Location	
System Contact	
System OID	1.3.6.1.4.1.24062.2.2.1
System Description	JetNet5010G Industrial Managed Switch
Firmware Version	v2.1.5 20080414
Device MAC	00:12:77:60:14:11

Copyright (c) 2006-2008 Korenix Technology Co., Ltd.. All Rights Reserved.

按一下以啟動和使用此控制項

Once you enter the web-based management interface, you can freely change the JetNet's IP address to fit your network environment.

Note 1: IE 5.0 or later versions do not allow Java applets to open sockets by default. Users have to directly modify the browser settings to selectively enable Java applets to use network ports.

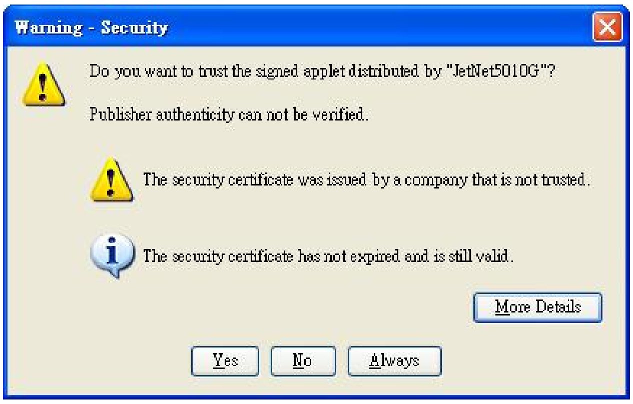
Note 2: The Web UI connection session of JetNet 5010G will be logged out automatically if you don't give any input after 30 seconds. After logged out, you should re-login and key in correct user name and password again.

3.2.2 Secured Web Interface

Korenix web management page also provides secured management HTTPS login. All the configuration commands will be secured and will be hard for the hackers to sniff the login password and configuration commands.

Launch the web browser and Login.

1. Launch the web browser (Internet Explorer or Mozila Firefox) on the PC.
2. Type **https://192.168.10.1** (or the IP address of the switch). And then press **Enter**.
3. The popup screen will appear and request you to trust the secured HTTPS connection distributed by JetNet 5010G first. Press **Yes** to trust it.



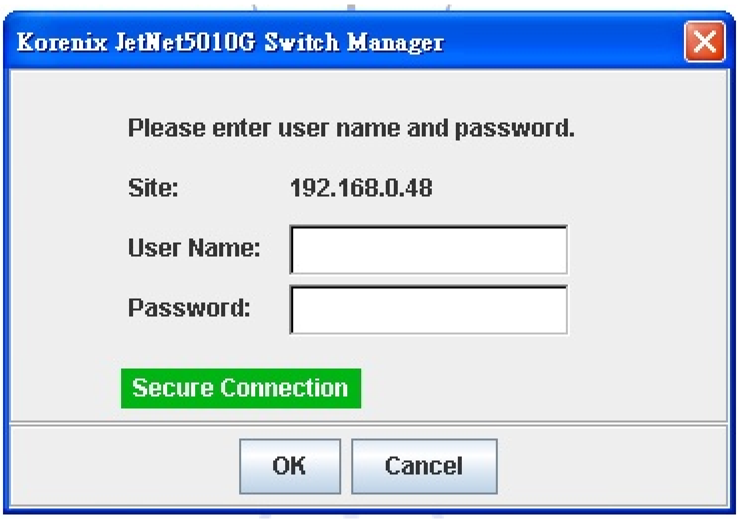
Do you want to trust the signed applet distributed by "JetNet5010G"?

Publisher authenticity can not be verified.

The security certificate was issued by a company that is not trusted.

The security certificate has not expired and is still valid.

4. The login screen will appear next.



Korenix JetNet5010G Switch Manager

Please enter user name and password.

Site: 192.168.0.48

User Name:

Password:

5. Key in the user name and the password. The default user name and password is **admin**.
6. Click on **Enter** or **OK.** Welcome page of the web-based management interface will then appear.
7. Once you enter the web-based management interface, all the commands you see are the same as what you see by HTTP login.

3.3 Preparation for Telnet Console

3.3.1 Telnet

Korenix JetNet 5010G supports Telnet console. You can connect to the switch by Telnet and the command lines are the same as what you see by RS232 console port. Below are the steps to open Telnet connection to the switch.

1. Go to Start -> Run -> cmd. And then press **Enter**
2. Type the **Telnet 192.168.10.1** (or the IP address of the switch). And then press **Enter**

3.3.2 SSH (Secure Shell)

Korenix JetNet 5010G also support SSH console. You can remotely connect to the switch by command line interface. The SSH connection can secure all the configuration commands you sent to the switch.

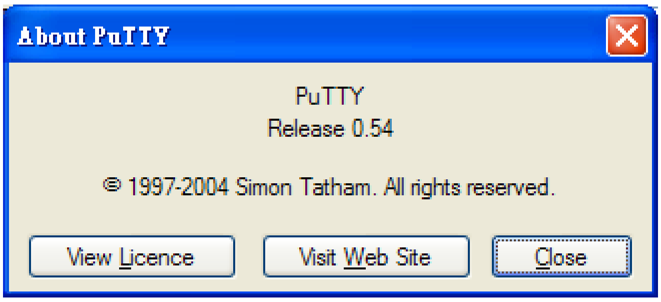
SSH is a client/server architecture while JetNet 5010G is the SSH server. When you want to make SSH connection with the switch, you should download the SSH client tool first.

SSH Client

There are many free, sharewares, trials or charged SSH clients you can find on the internet. Fox example, PuTTY is a free and popular Telnet/SSH client. We’ll use this tool to demonstrate how to login JetNet by SSH. Note: *PuTTY is copyright 1997-2006 Simon Tatham*.

Download PuTTY: http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

The copyright of **PuTTY**



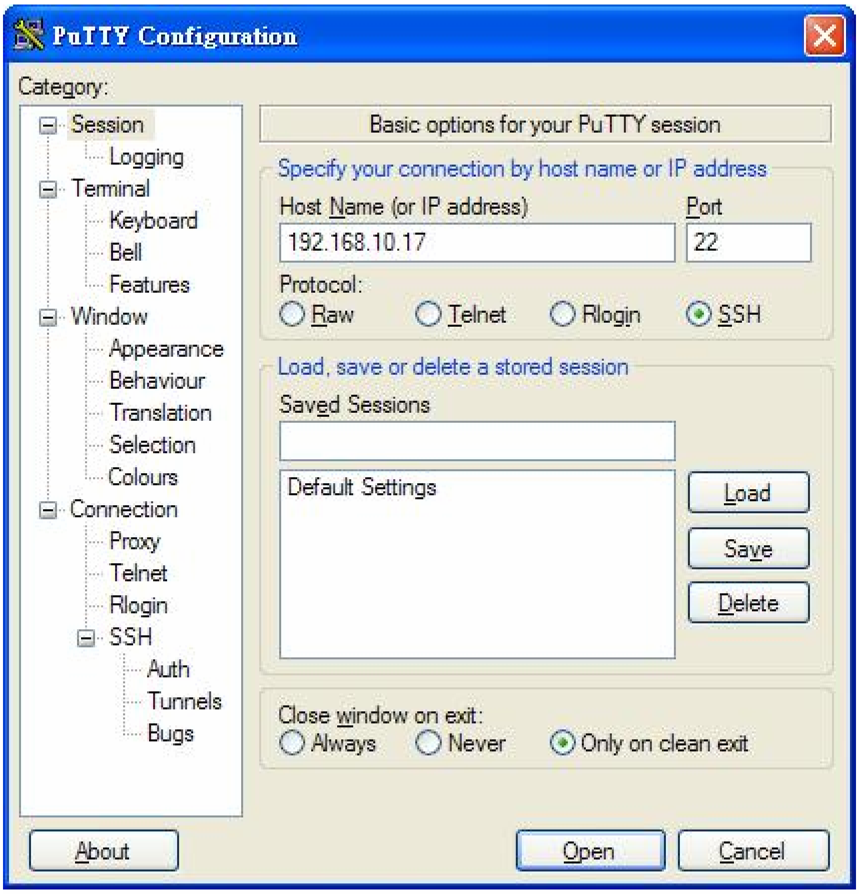
About PuTTY

PuTTY
Release 0.54

© 1997-2004 Simon Tatham. All rights reserved.

1. Open SSH Client/PuTTY

In the **Session** configuration, enter the **Host Name** (IP Address of your JetNet 5010G) and **Port number** (default = 22). Choose the "**SSH**" protocol. Then click on "**Open**" to start the SSH session console.



PuTTY Configuration

Basic options for your PuTTY session

Specify your connection by host name or IP address

Host Name (or IP address): 192.168.10.17

Port: 22

Protocol: ○ Raw ○ Telnet ○ Rlogin ● SSH

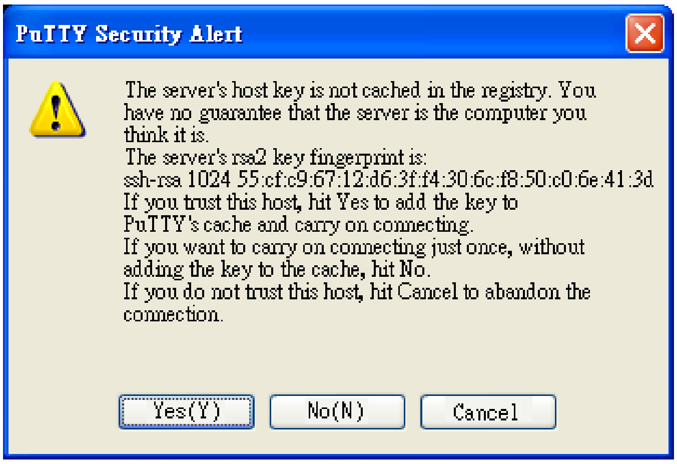
Load, save or delete a stored session

Saved Sessions

Default Settings

Close window on exit: ○ Always ○ Never ● Only on clean exit

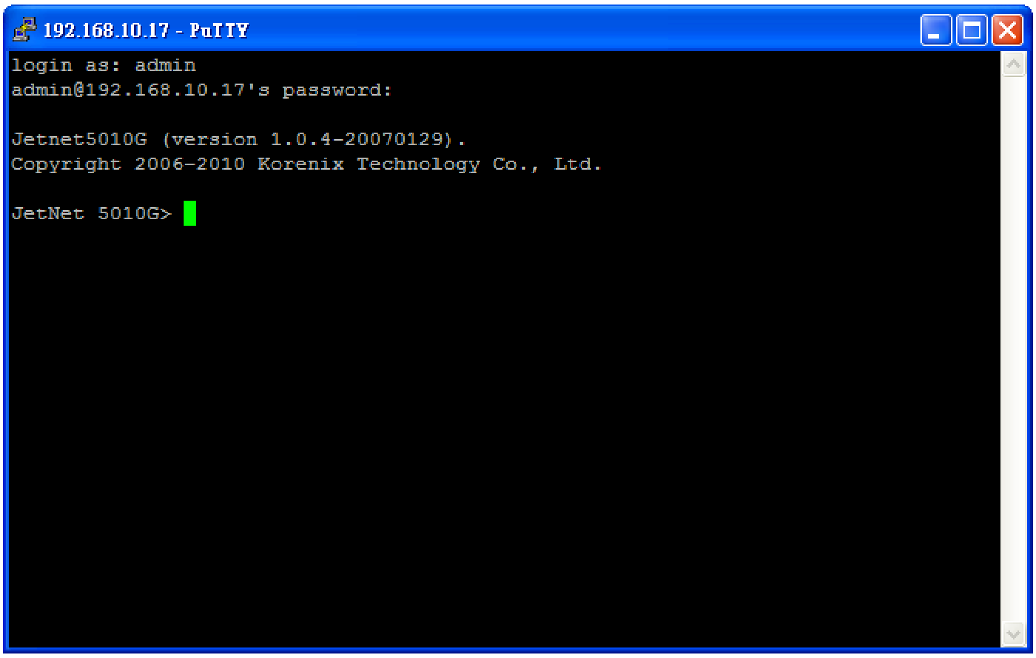
2. After click on **Open**, then you can see the cipher information in the popup screen. Press **Yes** to accept the Security Alert.



PuTTY Security Alert

The server's host key is not cached in the registry. You have no guarantee that the server is the computer you think it is.
The server's rsa2 key fingerprint is:
ssh-rsa 1024 55:cf:c9:67:12:d6:3f:f4:30:6c:f8:50:c0:6e:41:3d
If you trust this host, hit Yes to add the key to PuTTY's cache and carry on connecting.
If you want to carry on connecting just once, without adding the key to the cache, hit No.
If you do not trust this host, hit Cancel to abandon the connection.

3. After few seconds, the SSH connection to JetNet 5010G is opened. You can see the login screen as the below figure.



192.168.10.17 - PuTTY

```
login as: admin
admin@192.168.10.17's password:

Jetnet5010G (version 1.0.4-20070129).
Copyright 2006-2010 Korenix Technology Co., Ltd.

JetNet 5010G>
```

4. Type the Login Name and its Password. The default Login Name and Password are **admin / admin**.

5. All the commands you see in SSH are the same as the CLI commands you see via RS232 console. The next chapter will introduce in detail how to use command line to configure the switch.

4 Feature Configuration

This chapter explains how to configure JetNet 5010G software features. There are four ways to access the switch: Serial console, Telnet, Web browser and SNMP.

JetNet 5010G series Industrial Managed Switch provides both in-band and out-band configuration methods. You can configure the switch via RS232 console cable if you don't attach your admin PC to your network, or if you lose the network connection to your JetNet 5010G. This is so-called out-band management. It wouldn't be affected by the network performance.

The in-band management means you can remotely manage the switch via the network. You can choose Telnet or Web-based management. You just need to know the device's IP address. Then you can remotely connect to its embedded HTML web pages or Telnet console.

Korenix web management page is developed by JAVA. It allows you to use a standard web-browser such as Microsoft Internet Explorer, or Mozila, to configure and interrogate the switch from anywhere on the network.

Note: IE 5.0 or later versions do not allow Java applets to open sockets by default. Users have to directly modify the browser settings to selectively enable Java applets to use network ports.

Following topics are covered in this chapter:

4.1 Command Line Interface Introduction

The Command Line Interface (CLI) is the user interface to the switch's embedded software system. You can view the system information, show the status, configure the switch and receive a response back from the system by keying in a command.

There are some different command modes. Each command mode has its own access ability, available command lines and uses different command lines to enter and exit. These modes are User EXEC, Privileged EXEC, Global Configuration, (Port/VLAN) Interface Configuration modes.

User EXEC mode: As long as you login the switch by CLI. You are in the User EXEC mode. You can ping, telnet remote device, and show some basic information.

Type **enable** to enter next mode, **exit** to logout. **?** to see the command list

```
JN5010G>
  enable       Turn on privileged mode command
  exit         Exit current mode and down to previous mode
  list         Print command list
  ping         Send echo messages
  quit         Exit current mode and down to previous mode
  show         Show running system information
  telnet       Open a telnet connection
  traceroute   Trace route to destination
```

Privileged EXEC mode: Press enable in the User EXEC mode, then you can enter the Privileged EXEC mode. In this mode, the system allows you to view current configuration, reset default, reload switch, show system information, save configuration…and enter the global configuration mode.

Type **configure terminal** to enter next mode, **exit** to leave. **?** to see the command list

```
Switch#
  archive      manage archive files
  clear        Reset functions
  clock        Configure time-of-day clock
  configure    Configuration from vty interface
  copy         Copy from one file to another
  debug        Debugging functions (see also 'undebug')
  disable      Turn off privileged mode command
  end          End current mode and change to enable mode
  exit         Exit current mode and down to previous mode
  list         Print command list
  more         Display the contents of a file
  no           Negate a command or set its defaults
  ping         Send echo messages
  quit         Exit current mode and down to previous mode
  reboot       Reboot system
  reload       copy a default-config file to replace the current one
  show         Show running system information
  telnet       Open a telnet connection
  terminal     Set terminal line parameters
  traceroute   Trace route to destination
  write        Write running configuration to memory, network, or terminal
```

Global Configuration Mode: Press **configure terminal** in privileged EXEC mode. You can then enter global configuration mode. In global configuration mode, you can configure all the features that the system provides you.

Type **interface IFNAME/VLAN** to enter interface configuration mode, **exit** to leave. **?** to see the command list.

Available command lists of global configuration mode.

```
Switch# configure terminal
Switch(config)#
   access-list          Add an access list entry
   administrator        Administrator account setting
   arp                  Set a static ARP entry
   clock                Configure time-of-day clock
   default              Set a command to its defaults
   end                  End current mode and change to enable mode
   exit                 Exit current mode and down to previous mode
   gvrp                 GARP VLAN Registration Protocol
   hostname             Set system's network name
   interface            Select an interface to configure
   ip                   IP information
   lacp                 Link Aggregation Control Protocol
   list                 Print command list
   log                  Logging control
   mac                  Global MAC configuration subcommands
   mac-address-table    mac address table
   mirror               Port mirroring
   no                   Negate a command or set its defaults
   ntp                  Configure NTP
   password             Assign the terminal connection password
   qos                  Quality of Service (QoS)
   relay                relay output type information
   smtp-server          SMTP server configuration
   snmp-server          SNMP server
   spanning-tree        spanning tree algorithm
   super-ring           super-ring protocol
   trunk                Trunk group configuration
   vlan                 Virtual LAN
   warning-event        Warning event selection
   write-config         Specify config files to write to
```

(Port) Interface Configuration: Press **interface IFNAME** in global configuration mode. You can then enter interface configuration mode. In this mode, you can configure port settings.

The port interface name for fast Ethernet port 1 is fa1,… fast Ethernet 7 is fa7, gigabit Ethernet port 8 is gi8.. gigabit Ethernet port 10 is gi10. Type interface name accordingly when you want to enter certain interface configuration mode.

Type **exit** to leave.

Type **?** to see the command list

Available command lists of the global configuration mode.

```
Switch(config)# interface fa1
Switch(config-if)#
   acceptable            Configure 802.1Q acceptable frame types of a port.
   auto-negotiation     Enable auto-negotiation state of a given port
   description           Interface specific description
   duplex                 Specify duplex mode of operation for a port
   end                     End current mode and change to enable mode
   exit                    Exit current mode and down to previous mode
   flowcontrol           Set flow-control value for an interface
   garp                   General Attribute Registration Protocol
   ingress               802.1Q ingress filtering features
   lacp                   Link Aggregation Control Protocol
   list                   Print command list
   loopback             Specify loopback mode of operation for a port
   mac                    MAC interface commands
   mdix                    Enable mdix state of a given port
   no                      Negate a command or set its defaults
   qos                     Quality of Service (QoS)
   quit                   Exit current mode and down to previous mode
   rate-limit           Rate limit configuration
   shutdown              Shutdown the selected interface
   spanning-tree         spanning-tree protocol
   speed                   Specify the speed of a Fast Ethernet port or a Gigabit
Ethernet port.
   switchport            Set switching mode characteristics
```

(VLAN) Interface Configuration: Press **interface VLAN VLAN-ID** in global configuration mode. You can then enter VLAN interface configuration mode. In this mode, you can configure the settings for the specific VLAN.

The VLAN interface name of VLAN 1 is VLAN 1, VLAN 2 is VLAN 2…

Type **exit** to leave the mode.   Type **?** to see the available command list.

The command lists of the VLAN interface configuration mode.

```
Switch(config)# interface vlan 1
Switch(config-if)#
   description   Interface specific description
   end               End current mode and change to enable mode
   exit             Exit current mode and down to previous mode
   ip                Interface Internet Protocol config commands
   list             Print command list
   no                Negate a command or set its defaults
   quit             Exit current mode and down to previous mode
   shutdown        Shutdown the selected interface
```

Summary of the 5 command modes.

Command Mode	**Main Function**	**Enter and Exit Method**	**Prompt**
User EXEC	This is the first level of access. User can ping, telnet remote device, and show some basic information	Enter: **Login** successfully Exit: **exit** to logout. Next mode: Type **enable** to enter privileged EXEC mode.	Switch>
Privileged EXEC	In this mode, the system allows you to view current configuration, reset default, reload switch, show system information, save configuration…and enter global configuration mode.	Enter: Type **enable** in User EXEC mode. Exec: Type **disable** to exit to user EXEC mode. Type **exit** to logout Next Mode: Type **configure terminal** to enter global configuration command.	Switch#
Global configuration	In global configuration mode, you can configure all the features that the system provides you	Enter: Type **configure terminal** in privileged EXEC mode Exit: Type **exit** or **end** or press **Ctrl-Z** to exit. Next mode: Type **interface IFNAME/ VLAN VID** to enter interface configuration mode	Switch(config)#
Port Interface configuration	In this mode, you can configure port related settings.	Enter: Type **interface IFNAME** in global configuration mode. Exit: Type **exit** or **Ctrl+Z** to global configuration mode. Type **end** to privileged EXEC mode.	Switch(config-if)#
VLAN Interface Configuration	In this mode, you can configure settings for specific VLAN.	Enter: Type **interface VLAN VID** in global configuration mode. Exit: Type **exit** or **Ctrl+Z** to global configuration mode. Type **end** to privileged EXEC mode.	Switch(config-vlan)#

Here are some useful commands for you to see these available commands. Save your time in typing and avoid typing error.

? To see all the available commands in this mode. It helps you to see the next command you can/should type as well.

```
Switch(config)# interface (?)
   IFNAME    Interface's name
   vlan        Select a vlan to configure
```

(Character)? To see all the available commands starts from this character.

```
Switch(config)# a?
   access-list        Add an access list entry
   administrator     Administrator account setting
   arp                    Set a static ARP entry
```

Tab This tab key helps you to input the command quicker. If there is only one available command in the next, clicking on tab key can help to finish typing soon.

```
Switch# co (tab) (tab)
Switch# configure terminal

Switch(config)# ac (tab)
Switch(config)# access-list
```

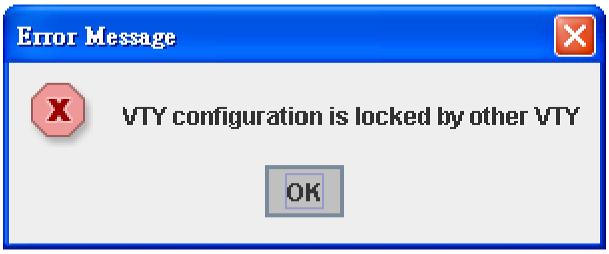
Ctrl+C To stop executing the unfinished command.

Ctrl+S To lock the screen of the terminal. You can't input any command.

Ctrl+Q To unlock the screen which is locked by Ctrl+S.

Ctrl+Z To exit configuration mode.

Alert message when multiple users want to configure the switch. If the administrator is in configuration mode, then the Web users can't change the settings. JetNet 5010G allows only one administrator to configure the switch at a time.



VTY configuration is locked by other VTY

4.2 Basic Setting

The Basic Setting group provides you to configure switch information, IP address, User name/Password of the system. It also allows you to do firmware upgrade, backup and restore configuration, reload factory default, and reboot the system.

Following commands are included in this group:

4.2.1 Switch Setting

4.2.2 Admin Password

4.2.3 IP Configuration

4.2.4 Time Setting

4.2.5 DHCP Server

4.2.6 Backup and Restore

4.2.7 Firmware Upgrade

4.2.8 Factory Default

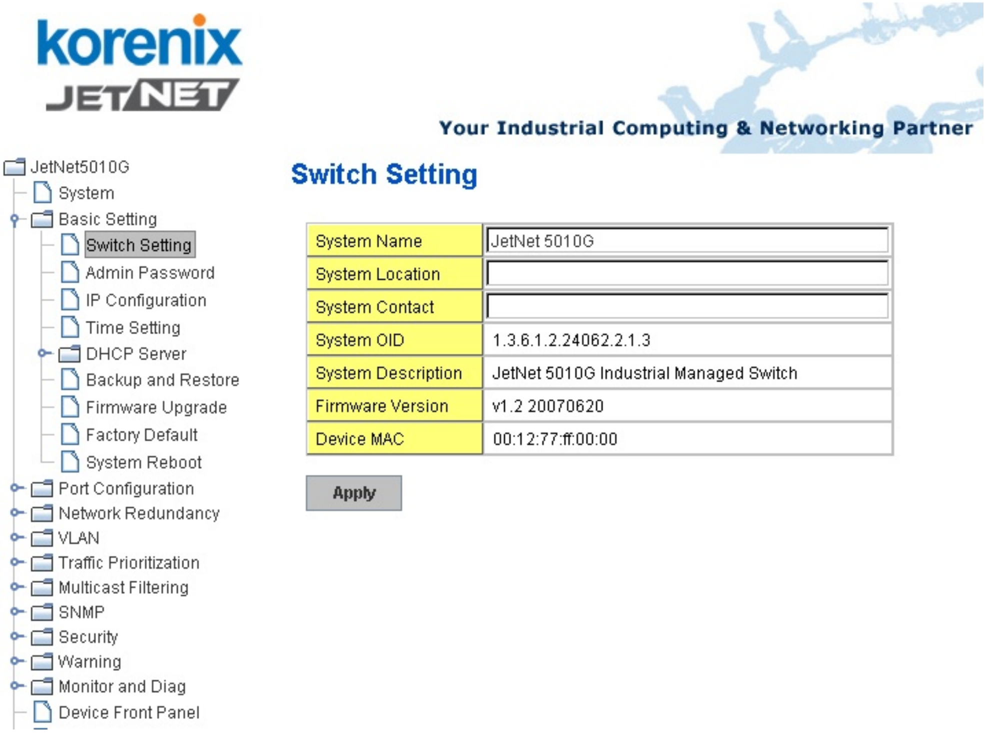
4.2.9 System Reboot

4.2.10 CLI Commands for Basic Setting

4.2.1 Switch Setting

You can assign System name, Location, Contact and view system information.

Figure 4.2.1.1 – Web UI of the Switch Setting



Switch Setting

System Name	JetNet 5010G
System Location	
System Contact	
System OID	1.3.6.1.2.24062.2.1.3
System Description	JetNet 5010G Industrial Managed Switch
Firmware Version	v1.2 20070620
Device MAC	00:12:77:ff:00:00

System Name: You can assign a name to the device. The available characters you can input is 64. After you configure the name, CLI system will select the first 12 characters as the name in CLI system.

System Location: You can specify the switch's physical location here. The available characters you can input are 64.

System Contact: You can specify contact people here. You can type the name, mail address or other information of the administrator. The available characters you can input are 64.

System OID: The SNMP object ID of the switch. You can follow the path to find its private MIB in MIB browser. (**Note:** When you attempt to view private MIB, you should compile private MIB files into your MIB browser first.)

System Description: JetNet 5010G Industrial Management Ethernet Switch is the name of this product.

Firmware Version: Display the firmware version installed in this device.

MAC Address: Display unique hardware address (MAC address) assigned by the manufacturer.

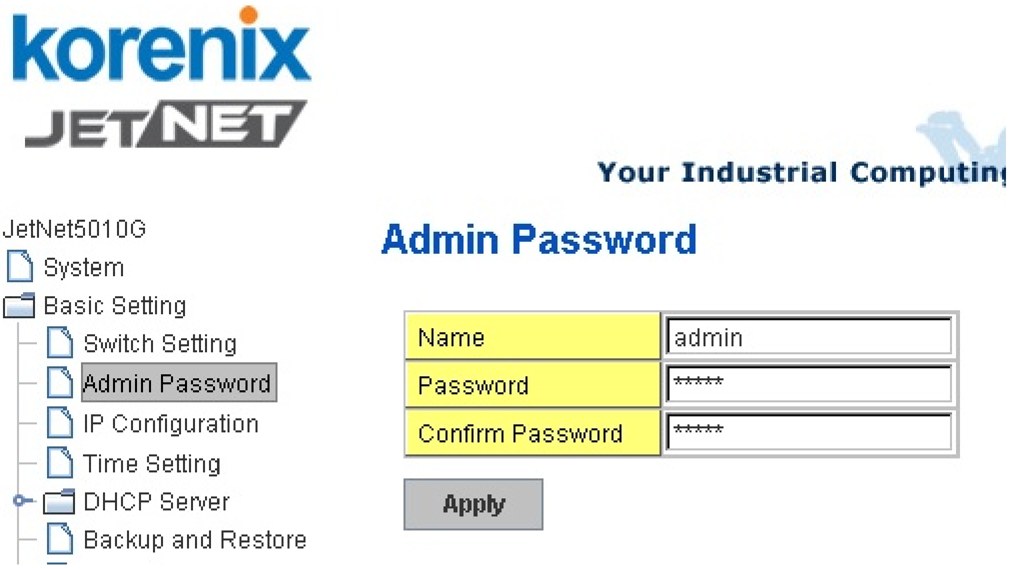
Once you finish the configuration, click on **Apply** to apply your settings.

Note: Always remember to select **Save** to save your settings. Otherwise, the settings you made will be lost when the switch is powered off.

4.2.2 Admin Password

You can change the user name and the password here to enhance security

Figure 4.2.2.1 Web UI of the Admin Password



Name	admin
Password	*****
Confirm Password	*****

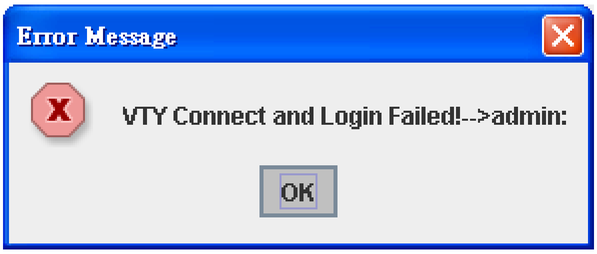
User name: You can key in new user name here. The default setting is **admin**.

Password: You can key in new password here. The default setting is **admin**.

Confirm Password: You need to type the new password again to confirm it.

Once you finish configuring the settings, click on **Apply** to apply your configuration.

Figure 4.2.2.2 Popup alert window for Incorrect Username.

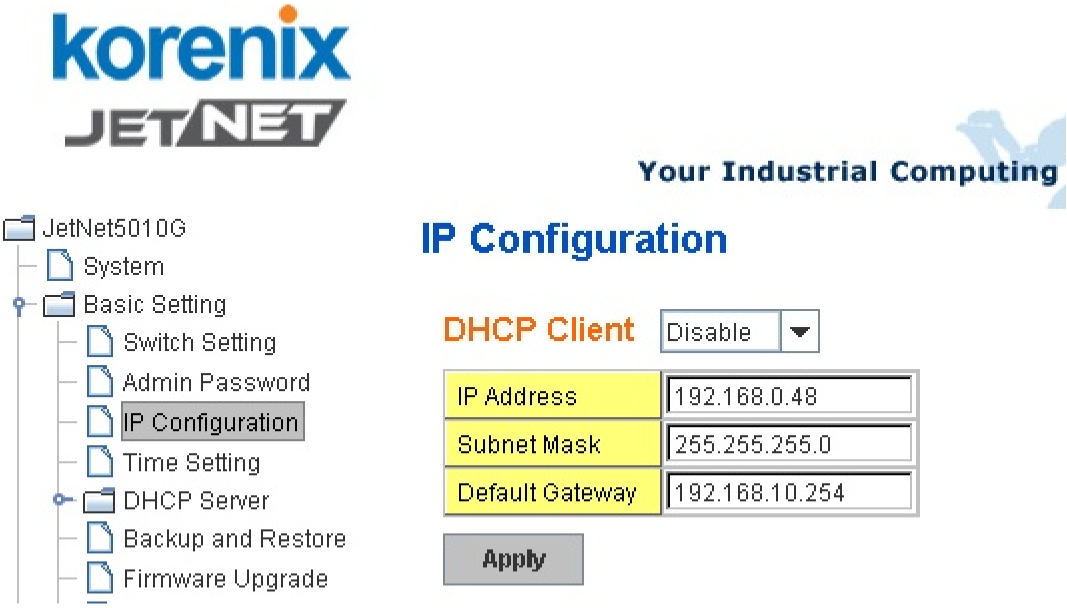


Error Message

VTY Connect and Login Failed!-->admin:

4.2.3 IP Configuration

This function allows users to configure the switch’s IP address settings.



IP Configuration

DHCP Client: Disable

IP Address: 192.168.0.48

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.10.254

DHCP Client: You can select to **Enable** or **Disable** DHCP Client function. When DHCP Client function is enabled, an IP address will be assigned to the switch from the network’s DHCP server. In this mode, the default IP address will therefore be replaced by the one assigned by DHCP server. If DHCP Client is disabled, then the IP address that you specified will be used instead.

IP Address: You can assign the IP address reserved by your network for your JetNet. If DHCP Client function is enabled, you don’t need to assign an IP address to the JetNet, as it will be overwritten by DHCP server and shown here. The default IP is 192.168.10.1.

Subnet Mask: You can assign the subnet mask for the IP address here. If DHCP Client function is enabled, you don’t need to assign the subnet mask. The default Subnet Mask is 255.255.255.0. **Note:** In the CLI, we use the enabled bit of the subnet mask to represent the number displayed in web UI. For example, 8 stands for 255.0.0.0; 16 stands for 255.255.0.0; 24 stands for 255.255.255.0.

Default Gateway: You can assign the gateway for the switch here. The default gateway is 192.168.10.254. **Note:** In CLI, we use 0.0.0.0/0 to represent for the default gateway.

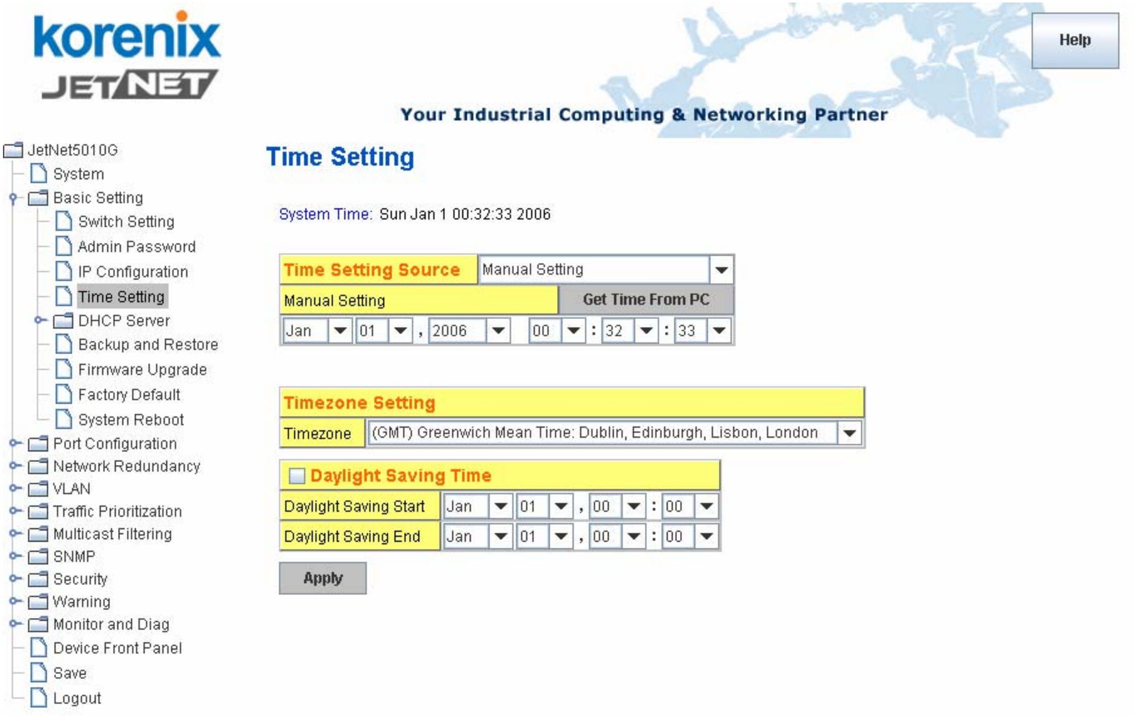
Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.2.4 Time Setting

Time Setting source allow user to set the time manually or through NTP server. Network

Time Protocol (NTP) is used to synchronize computer clocks on the internet. You can configure NTP settings here to synchronize the clocks of several switches on the network.

JetNet 5010G also provides Daylight Saving function.



Time Setting

System Time: Sun Jan 1 00:32:33 2006

Time Setting Source: Manual Setting

Manual Setting: Jan 01 , 2006 00 : 32 : 33

Timezone Setting

Timezone: (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London

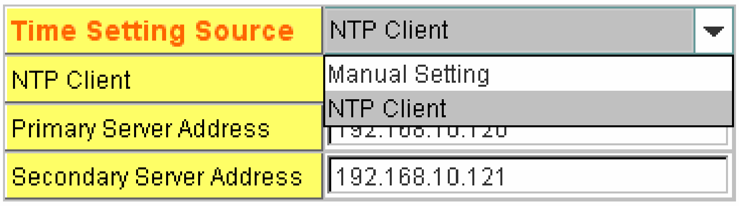
□ Daylight Saving Time

Daylight Saving Start: Jan 01 , 00 : 00

Daylight Saving End: Jan 01 , 00 : 00

Manual Setting: User can select Manual setting to change time as user wants. User also can click the button "Get Time from PC" to get PC's time setting for switch.

NTP client: Select the Time Setting Source to NTP client can let device enable the NTP client service. NTP client will be automatically enabled if you change Time source to NTP Client. The system will send request packet to acquire current time from the NTP server you assigned.



Time Setting Source: NTP Client

NTP Client

Primary Server Address: 192.168.10.120

Secondary Server Address: 192.168.10.121

Time-zone: Select the time zone where the switch is located. Following table lists the time zones for different locations for your reference. The default time zone is GMT Greenwich Mean Time.

```
Switch(config)# clock timezone
   01   (GMT-12:00) Eniwetok, Kwajalein
   02   (GMT-11:00) Midway Island, Samoa
   03   (GMT-10:00) Hawaii
   04   (GMT-09:00) Alaska
   05   (GMT-08:00) Pacific Time (US & Canada) , Tijuana
   06   (GMT-07:00) Arizona
   07   (GMT-07:00) Mountain Time (US & Canada)
   08   (GMT-06:00) Central America
   09   (GMT-06:00) Central Time (US & Canada)
   10   (GMT-06:00) Mexico City
   11   (GMT-06:00) Saskatchewan
   12   (GMT-05:00) Bogota, Lima, Quito
   13   (GMT-05:00) Eastern Time (US & Canada)
   14   (GMT-05:00) Indiana (East)
   15   (GMT-04:00) Atlantic Time (Canada)
   16   (GMT-04:00) Caracas, La Paz
   17   (GMT-04:00) Santiago
   18   (GMT-03:00) NewFoundland
   19   (GMT-03:00) Brasilia
   20   (GMT-03:00) Buenos Aires, Georgetown
   21   (GMT-03:00) Greenland
   22   (GMT-02:00) Mid-Atlantic
   23   (GMT-01:00) Azores
   24   (GMT-01:00) Cape Verde Is.
   25   (GMT) Casablanca, Monrovia
   26   (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
   27   (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
   28   (GMT+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague
   29   (GMT+01:00) Brussels, Copenhagen, Madrid, Paris
   30   (GMT+01:00) Sarajevo, Skopje, Sofija, Vilnius, Warsaw, Zagreb
   31   (GMT+01:00) West Central Africa
   32   (GMT+02:00) Athens, Istanbul, Minsk
   33   (GMT+02:00) Bucharest
   34   (GMT+02:00) Cairo
   35   (GMT+02:00) Harare, Pretoria
   36   (GMT+02:00) Helsinki, Riga, Tallinn
   37   (GMT+02:00) Jerusalem
   38   (GMT+03:00) Baghdad
   39   (GMT+03:00) Kuwait, Riyadh
   40   (GMT+03:00) Moscow, St. Petersburg, Volgograd
   41   (GMT+03:00) Nairobi
   42   (GMT+03:30) Tehran
   43   (GMT+04:00) Abu Dhabi, Muscat
   44   (GMT+04:00) Baku, Tbilisi, Yerevan
   45   (GMT+04:30) Kabul
   46   (GMT+05:00) Ekaterinburg
   47   (GMT+05:00) Islamabad, Karachi, Tashkent
   48   (GMT+05:30) Calcutta, Chennai, Mumbai, New Delhi
   49   (GMT+05:45) Kathmandu
   50   (GMT+06:00) Almaty, Novosibirsk
   51   (GMT+06:00) Astana, Dhaka
   52   (GMT+06:00) Sri Jayawardenepura
   53   (GMT+06:30) Rangoon
   54   (GMT+07:00) Bangkok, Hanoi, Jakarta
   55   (GMT+07:00) Krasnoyarsk
```

56 (GMT+08:00) Beijing, Chongqing, Hong Kong, Urumqi
57 (GMT+08:00) Irkutsk, Ulaan Bataar
58 (GMT+08:00) Kuala Lumpur, Singapore
59 (GMT+08:00) Perth
60 (GMT+08:00) Taipei
61 (GMT+09:00) Osaka, Sapporo, Tokyo
62 (GMT+09:00) Seoul
63 (GMT+09:00) Yakutsk
64 (GMT+09:30) Adelaide
65 (GMT+09:30) Darwin
66 (GMT+10:00) Brisbane
67 (GMT+10:00) Canberra, Melbourne, Sydney
68 (GMT+10:00) Guam, Port Moresby
69 (GMT+10:00) Hobart
70 (GMT+10:00) Vladivostok
71 (GMT+11:00) Magadan, Solomon Is., New Caledonia
72 (GMT+12:00) Aukland, Wellington
73 (GMT+12:00) Fiji, Kamchatka, Marshall Is.
74 (GMT+13:00) Nuku'alofa

Daylight Saving Time: Set when Enable Daylight Saving Time start and end, during the Daylight Saving Time, the device's time is one hour earlier than the actual time.

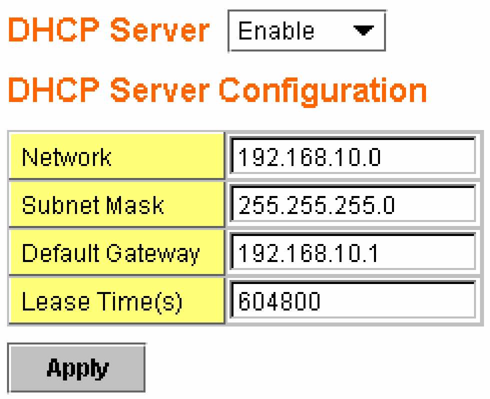
Once you finish your configuration, click on **Apply** to apply your configuration.

4.2.5 DHCP Server

You can select to **Enable** or **Disable** DHCP Server function. *JetNet 5010G* will assign a new IP address to link partners.

DHCP Server configuration

After selecting to enable DHCP Server function, type in the Network IP address for the DHCP server IP pool, Subnet Mask, Default Gateway address and Lease Time for client.


DHCP Server: Enable

DHCP Server Configuration

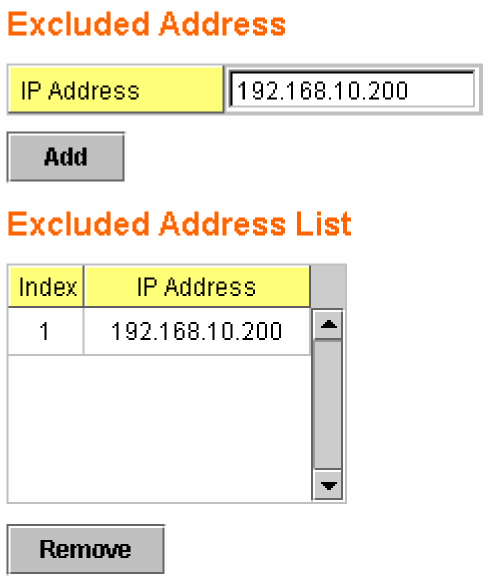
Network	192.168.10.0
Subnet Mask	255.255.255.0
Default Gateway	192.168.10.1
Lease Time(s)	604800

Once you have finished the configuration, click **Apply** to apply your configuration

Excluded Address:

You can type a specific address into the **IP Address field** for the DHCP server reserved IP address.

The IP address that is listed in the **Excluded Address List Table** will not be assigned to the network device. Add or remove an IP address from the **Excluded Address List** by clicking **Add** or **Remove**.



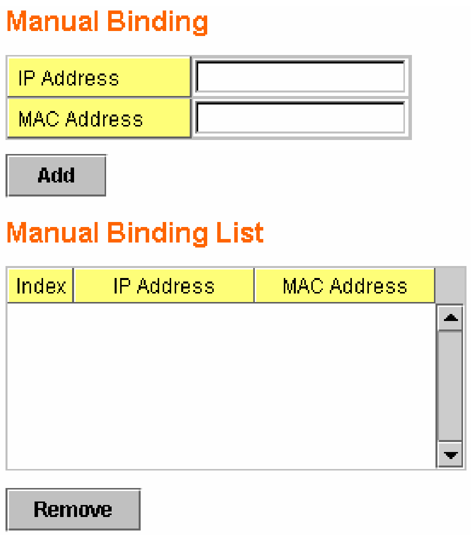
Excluded Address

IP Address	192.168.10.200

Excluded Address List

Index	IP Address
1	192.168.10.200

Manual Binding: *JetNet 5010G* provides a MAC address and IP address binding and removing function. You can type in the specified IP and MAC address, then click **Add** to add a new MAC&IP address binding rule for a specified link partner, like PLC or any device without **DHCP client** function. To remove from the binding list, just select the rule to remove and click **Remove**.



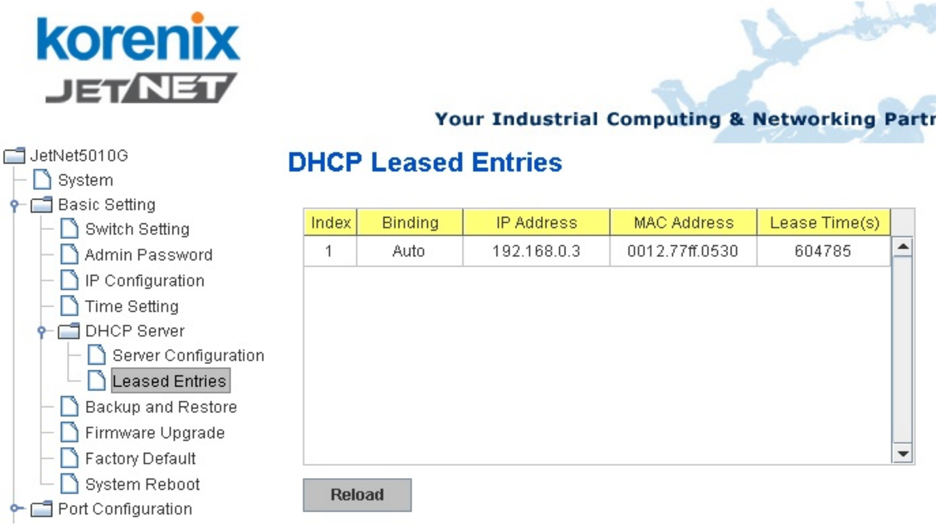
Manual Binding

IP Address	
MAC Address	

Manual Binding List

Index	IP Address	MAC Address

DHCP Leased Entries: *JetNet 5010G* provides an assigned IP address list for user check. It will show the MAC and IP address that was assigned by *JetNet 5010G*. Click the **Reload** button to refresh the listing.



DHCP Leased Entries

Index	Binding	IP Address	MAC Address	Lease Time(s)
1	Auto	192.168.0.3	0012.77ff.0530	604785

DHCP Relay Agent

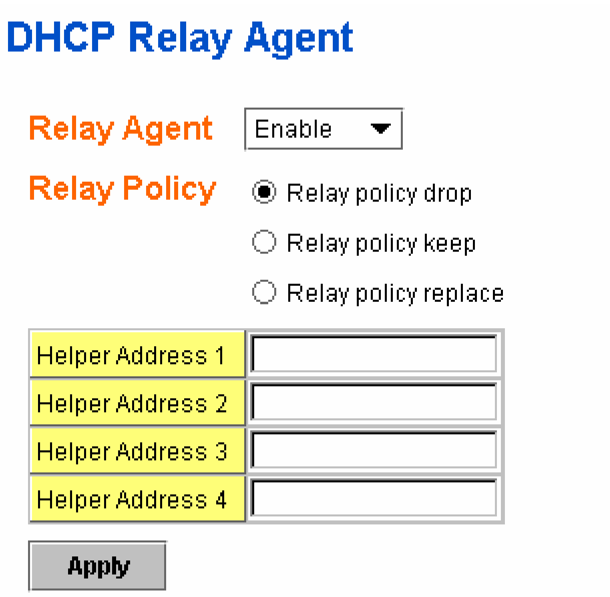
You can select to **Enable** or **Disable** DHCP relay agent function, and then select the modification type of option 82 field.

Relay policy drop: Drops the option 82 field and do not add any option 82 field.

Relay policy keep: Keeps the original option 82 field and forwards to server.

Relay policy replace: Replaces the existing option 82 field and adds new option 82 field. (This is the default setting)

Helper Address: there are 4 fields for the DHCP server's IP address. You can filll the field with prefered IP address of DHCP Server, and then click "Apply" to activate the DHCP relay agent function. All the DHCP packets from client will be modified by the policy and forwarded to DHCP server through the gateway port.



DHCP Relay Agent

Relay Agent: Enable

Relay Policy: ● Relay policy drop ○ Relay policy keep ○ Relay policy replace

Helper Address 1	
Helper Address 2	
Helper Address 3	
Helper Address 4	

4.2.6 Backup and Restore

With Backup command, you can save current configuration file saved in the switch's flash to admin PC or TFTP server. This will allow you to go to **Restore** command later to restore the configuration file back to the switch. Before you restore the configuration file, you must place the backup configuration file in the PC or TFTP server. The switch will then download this file back to the flash.

There are 2 modes for users to backup/restore the configuration file, Local File mode and TFTP Server mode.

Local File mode: In this mode, the switch acts as the file server. Users can browse the target folder and then type the file name to backup the configuration. Users can also browse the target folder and select existed configuration file to restore the configuration back to the switch. This mode is only provided by Web UI while CLI is not supported.

TFTP Server mode: In this mode, the switch acts as TFTP client. Before you do so, make sure that your TFTP server is ready. Then please type the IP address of TFTP Server and Backup configuration file name. This mode can be used in both CLI and Web UI.

TFTP Server IP Address: You need to key in the IP address of your TFTP Server here.

Backup/Restore File Name: Please type the correct file name of the configuration file..

Configuration File: The configuration file of the switch is a pure text file. You can open it by word/txt read file. You can also modify the file, add/remove the configuration settings, and then restore back to the switch.

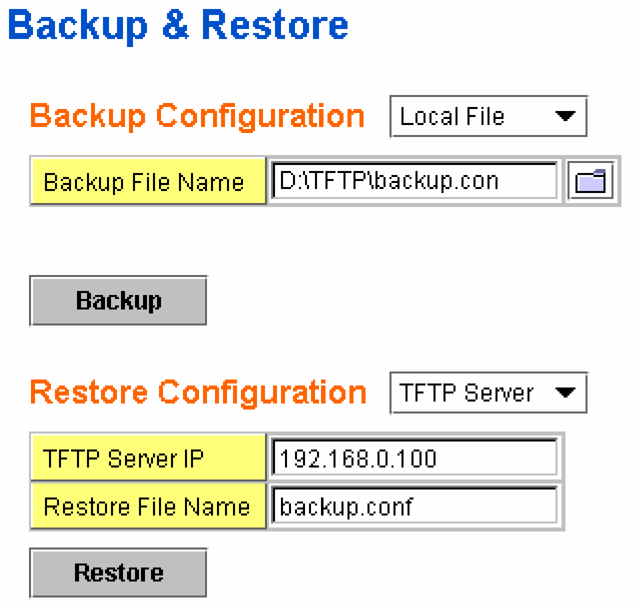
Startup Configuration File: After you saved the running-config to flash, the new settings will be kept and work after power cycle. You can use *show startup-config* to view it in CLI. The Backup command can only backup such configuration file to your PC or TFTP server.

Technical Tip:

Default Configuration File: *The switch provides the default configuration file in the system. You can use Reset button, Reload command to reset the system.*

Running Configuration File: *The switch's CLI allows you to view the latest settings running by the system. The information shown here is the settings you set up but haven't saved to flash. The settings not yet saved to flash will not work after power recycle. You can* use *show running-config* to view it in CLI.

Figure 4.2.6.1 Main UI of Backup & Restore



Backup & Restore

Backup Configuration: Local File

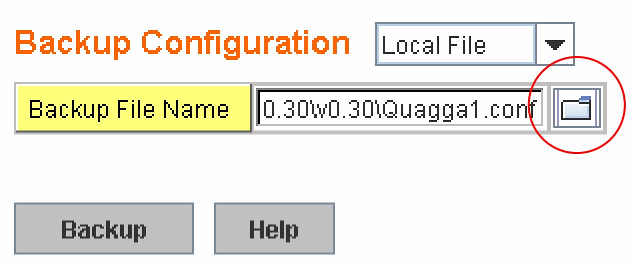
Backup File Name: D:\TFTP\backup.con

Restore Configuration: TFTP Server

TFTP Server IP: 192.168.0.100

Restore File Name: backup.conf

Figure 4.2.6.2 Bacup/Restore Configuration - Local File mode.



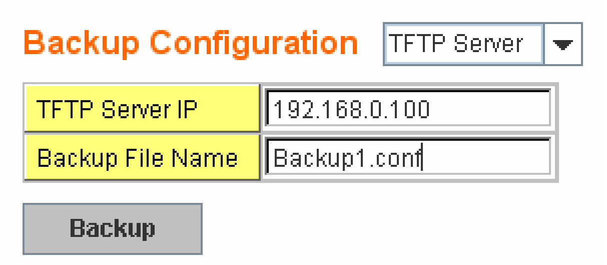
Backup Configuration: Local File

Backup File Name: 0.30\v0.30\Quagga1.conf

Click on Folder icon to select the target file you want to backup/restore.

Note that the folders of the path to the target file do not allow you to input space key.

Figure 4.2.6.3 Backup/Restore Configuration - TFTP Server mode



Backup Configuration: TFTP Server

TFTP Server IP: 192.168.0.100

Backup File Name: Backup1.conf

Type the IP address of TFTP Server IP. Then click on **Backup/Restore**.

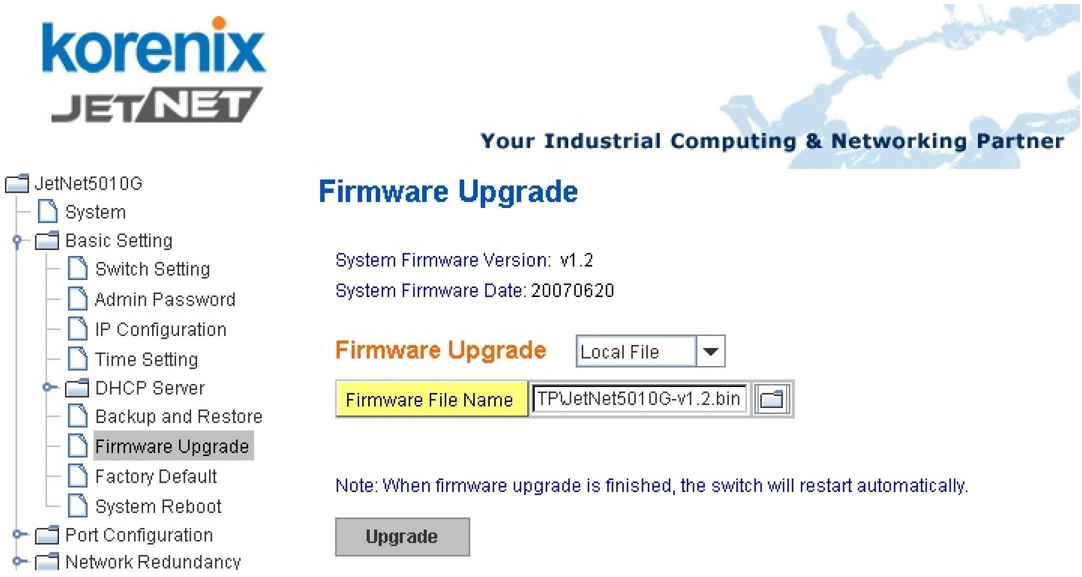
Note: point to the wrong file will cause the entire configuration missed

4.2.7 Firmware Upgrade

In this section, you can update the latest firmware for your switch. Korenix provides the latest firmware in Korenix Web site. The new firmware may include new features, bug fixes or other software changes. We'll also provide the release notes for the update as well. For technical viewpoint, we suggest you use the latest firmware before installing the switch to the customer site.

Note that the system will be automatically rebooted after you finished upgrading new firmware. Please remind the attached users before you do this.

Figure 4.2.7.1 Main UI of Firmware Upgrade



Firmware Upgrade

System Firmware Version: v1.2
System Firmware Date: 20070620

Firmware Upgrade: Local File

Firmware File Name: TP\JetNet5010G-v1.2.bin

Note: When firmware upgrade is finished, the switch will restart automatically.

There are 2 modes for users to backup/restore the configuration file, Local File mode and TFTP Server mode.

Local File mode: In this mode, the switch acts as the file server. Users can browse the target folder and then type the file name to backup the configuration. Users also can browse the target folder and select the existed configuration file to restore the configuration back to the switch. This mode is only provided by Web UI while CLI is not supported.

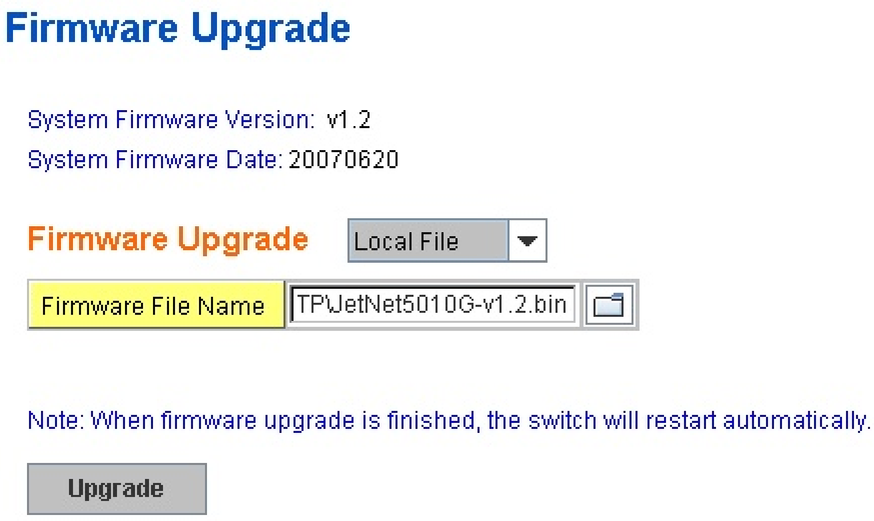
TFTP Server mode: In this mode, the switch acts as the TFTP client. Before you do so, make sure that your TFTP server is ready. And then please type the IP address of TFTP Server IP address. This mode can be used in both CLI and Web UI.

TFTP Server IP Address: You need to key in the IP address of your TFTP Server here.

Firmware File Name: The file name of the new firmware.

The UI also shows you the current firmware version and built date of current firmware. Please check the version number after the switch is rebooted.

Figure 4.2.7.2 Firmware Upgrade - Local File mode.



Firmware Upgrade

System Firmware Version: v1.2
System Firmware Date: 20070620

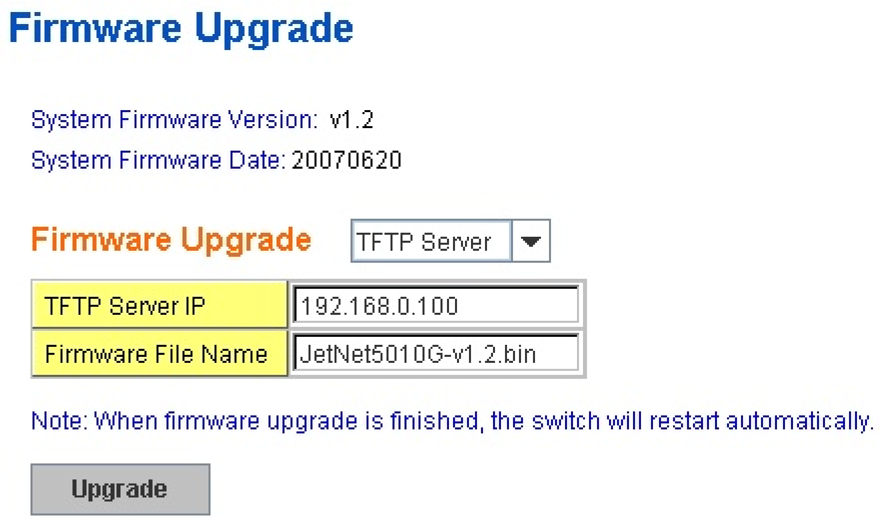
Firmware Upgrade: Local File

Firmware File Name: TP\JetNet5010G-v1.2.bin

Note: When firmware upgrade is finished, the switch will restart automatically.

Click on Folder icon to select the target firmware file you want to upgrade.

Figure 4.2.7.3 Firmware Upgrade – TFTP Server mode.



Firmware Upgrade

System Firmware Version: v1.2

System Firmware Date: 20070620

Firmware Upgrade: TFTP Server

TFTP Server IP	192.168.0.100
Firmware File Name	JetNet5010G-v1.2.bin

Note: When firmware upgrade is finished, the switch will restart automatically.

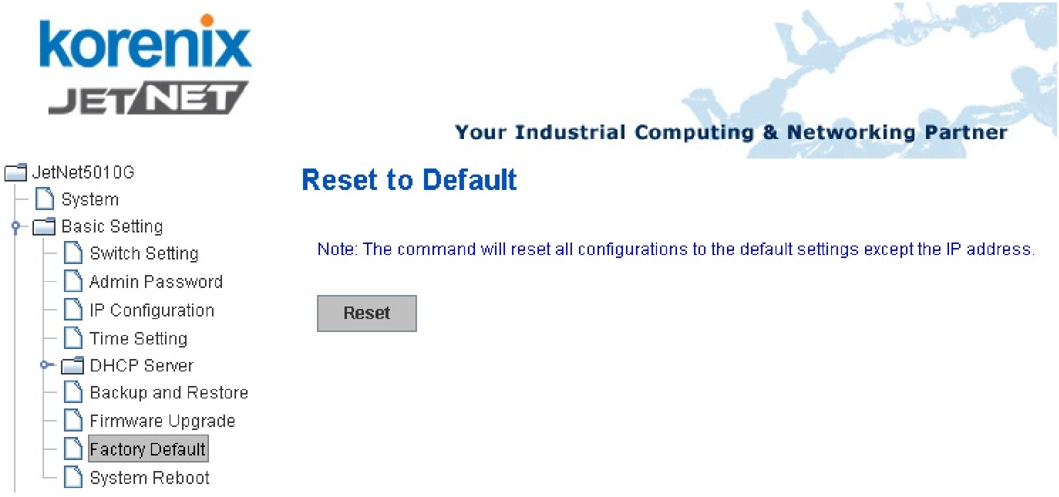
Type the IP address of TFTP Server and Firmware File Name. Then click on **Upgrade** to start the process.

After finishing transmitting the firmware, the system will copy the firmware file and replace the firmware in the flash. The CLI show …… until the process is finished.

4.2.8 Factory Default

In this section, you can reset all the configurations of the switch to default setting. Click on **Reset** the system will then reset all configurations to default setting. The system will show you popup message window after finishing this command. Default setting will work after rebooting the switch.

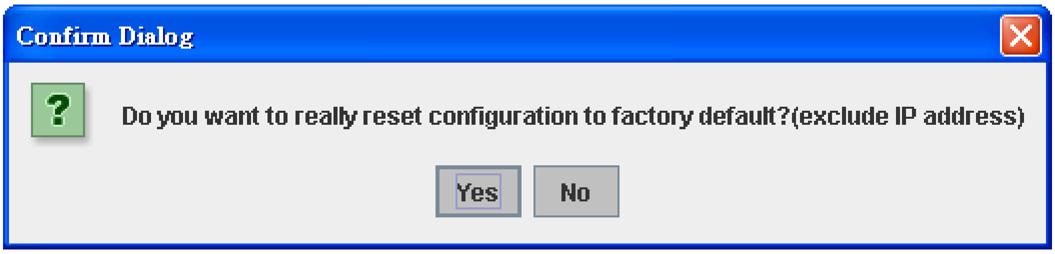
Figure- 4.2.8.1 The main screen of the Reset to Default



Reset to Default

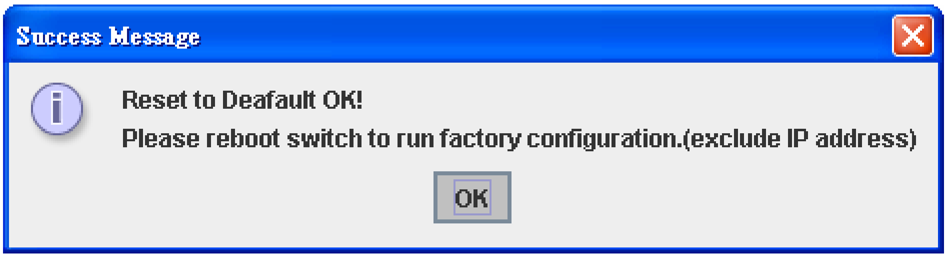
Note: The command will reset all configurations to the default settings except the IP address.

Figure 4.2.8.2 Popup alert screen to confirm the command. Click on **Yes** to start it.



Do you want to really reset configuration to factory default?(exclude IP address)

Figure 4.2.8.3 Popup message screen to show you that have done the command. Click on **OK** to close the screen. Then please go to **Reboot** page to reboot the switch.



Reset to Deafault OK!
Please reboot switch to run factory configuration.(exclude IP address)

Click on **OK.** The system will then auto reboot the device.

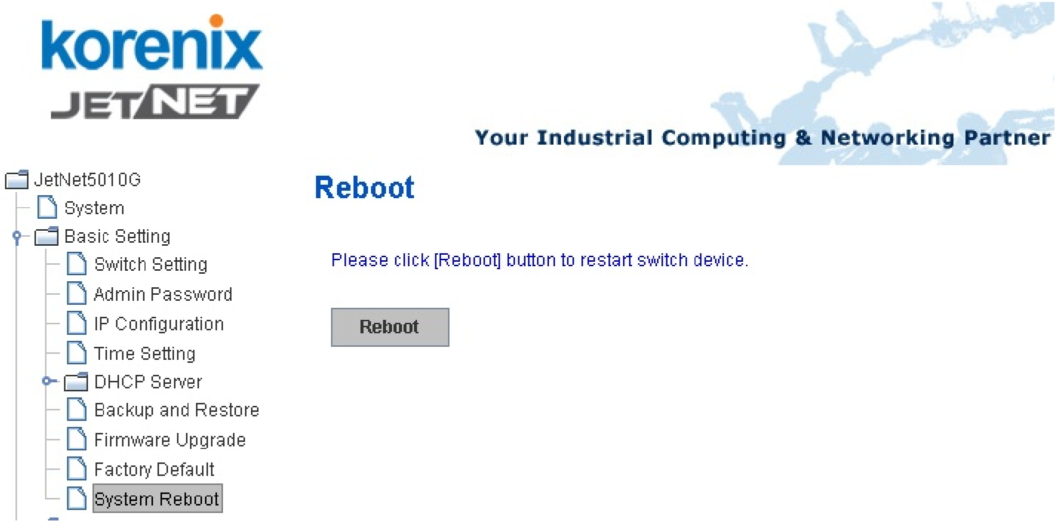
Note: If you already configured the IP of your device to other IP address, when you use this command by CLI and Web UI, our software will not reset the IP address to default IP. The system will remain the IP address so that you can still connect the switch via the network.

4.2.9 System Reboot

System Reboot allows you to reboot the device. Some of the feature changes require you to reboot the system. Click on **Reboot** to reboot your device.

Note: *Remember to click on* ***Save*** *button to save your settings. Otherwise, the settings you made will be gone when the switch is powered off.*

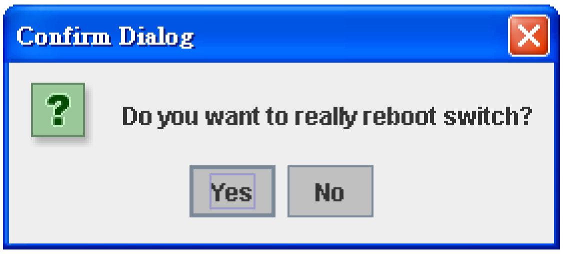
Figure 4.2.9.1 Main screen for Rebooting



Reboot

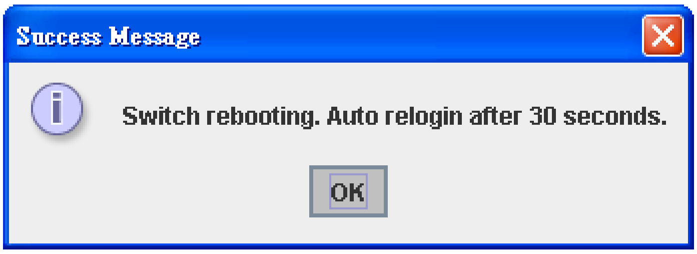
Please click [Reboot] button to restart switch device.

Figure 4.2.9.2 Pop-up alert screen to request confirmation. Click on **Yes**. Then the switch will be rebooted immediately.



Do you want to really reboot switch?

Figure 4.2.9.3 Pop-up message screen appears when rebooting the switch..



Switch rebooting. Auto relogin after 30 seconds.

4.2.10 CLI Commands for Basic Setting

Feature	Command Line
Switch Setting	
System Name	Switch(config)# hostname WORD Network name of this system Switch(config)# hostname JN5010G SWITCH(config)#
System Location	SWITCH(config)# snmp-server location Taipei

System Contact	SWITCH(config)# snmp-server contact korecare@korenix.com
Display	SWITCH# show snmp-server name SWITCH SWITCH# show snmp-server location Taipei SWITCH# show snmp-server contact korecare@korenix.com SWITCH> show version 0.31-20061218 Switch# show hardware mac MAC Address : 00:12:77:FF:01:B0
Admin Password	
User Name and Password	SWITCH(config)# administrator NAME Administrator account name SWITCH(config)# administrator orwell PASSWORD Administrator account password SWITCH(config)# administrator orwell orwell Change administrator account orwell and password orwell success.
Display	SWITCH# show administrator Administrator account information name: orwell password: orwell
IP Configuration	
IP Address/Mask (192.168.10.8, 255.255.255.0	SWITCH(config)# int vlan 1 SWITCH(config-if)# ip address dhcp SWITCH(config-if)# ip address 192.168.10.8/24 SWITCH(config-if)# ip dhcp client SWITCH(config-if)# ip dhcp client renew
Gateway	SWITCH(config)# ip route 0.0.0.0/0 192.168.10.254/24
Remove Gateway	SWITCH(config)# no ip route 0.0.0.0/0 192.168.10.254/24
Display	SWITCH# show running-config ……… ! interface vlan1 ip address 192.168.10.8/24 no shutdown ! ip route 0.0.0.0/0 192.168.10.254/24 !
Time Setting	
NTP Server	SWITCH(config)# ntp peer enable disable primary secondary SWITCH(config)# ntp peer primary IPADDR SWITCH(config)# ntp peer primary 192.168.10.120

Time Zone	SWITCH(config)# clock timezone 26 Sun Jan 1 04:13:24 2006 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London **Note:** By typing clock timezone ?, you can see the timezone list. Then choose the number of the timezone you want to select.
Display	SWITCH# sh ntp associations Network time protocol Status : Disabled Primary peer : N/A Secondary peer : N/A SWITCH# show clock Sun Jan 1 04:14:19 2006 (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London SWITCH# show clock timezone clock timezone (26) (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
DHCP Server	
DHCP Server configuration	Enable DHCP Server on JetNet Switch Switch# Switch# configure terminal Switch(config)# router dhcp Switch(config-dhcp)# service dhcp Configure DHCP network address pool Switch(config-dhcp)#network 50.50.50.0/4 -(network/mask) Switch(config-dhcp)#default-router 50.50.50.1
Lease time configure	Switch(config-dhcp)#lease 300 (300 sec)
DHCP Relay Agent	Enable DHCP Relay Agent Switch# Switch# configure terminal Switch(config)# router dhcp Switch(config-dhcp)# service dhcp Switch(config-dhcp)# ip dhcp relay information option Enable DHCP Relay policy Switch(config-dhcp)# ip dhcp relay information policy replace drop Relay Policy keep Drop/Keep/Replace option82 field replace
Show DHCP server information	Switch# show ip dhcp server statistics Switch# show ip dhcp server statistics DHCP Server ON Address Pool 1 network:192.168.17.0/24 default-router:192.168.17.254 lease time:300 Excluded Address List IP Address --------------- (list excluded address) Manual Binding List IP Address MAC Address

	--------------- -------------- (list IP & MAC binding entry) Leased Address List IP Address MAC Address Leased Time Remains --------------- -------------- -------------------- (list leased Time remain information for each entry)
Backup and Restore	
Backup Startup Configuration file	Switch# copy startup-config tftp: 192.168.10.33/default.conf Writing Configuration [OK] ***Note 1:*** *To backup the latest startup configuration file, you should save current settings to flash first. You can refer to 4.12 to see how to save settings to the flash.* *Note 2: 192.168.10.33 is the TFTP server's IP and default.conf is name of the configuration file. Your environment may use different IP addresses or different file name. Please type target TFTP server IP or file name in this command.*
Restore Configuration	Switch# copy tftp: 192.168.10.33/default.conf startup-config
Show Startup Configuration	Switch# show startup-config
Show Running Configuration	Switch# show running-config
Firmware Upgrade	
Firmware Upgrade	Switch# archive download-sw /overwrite tftp 192.168.10.33 JN5010G.bin Firmware upgrading, don't turn off the switch! Tftping file JN5010G.bin Firmware upgrading .... Firmware upgrade success!! Rebooting.......
Factory Default	
Factory Default	Switch# reload default-config file Reload OK! Switch# reboot
System Reboot	
Reboot	Switch# reboot

4.3 Port Configuration

Port Configuration group enables you to enable/disable port state, or configure port auto-negotiation, speed, and duplex, flow control, rate limit control and port aggregation settings. It also allows you to view port status and aggregation information.

Following commands are included in this group:

4.3.1 Port Control

4.3.2 Port Status

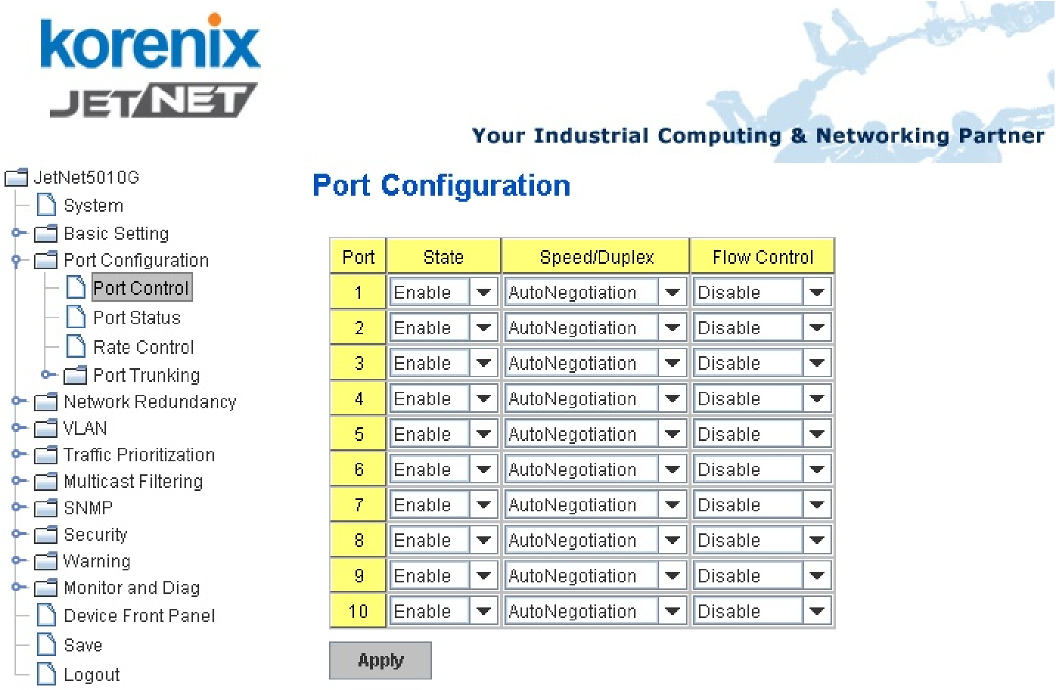
4.3.3 Rate Control

4.3.4 Port Trunking

4.3.5 Command Lines for Port Configuration

4.3.1 Port Control

Port Control commands allow you to enable/disable port state, or configure the port auto-negotiation, speed, duplex and flow control.



Port Configuration

Port	State	Speed/Duplex	Flow Control
1	Enable	AutoNegotiation	Disable
2	Enable	AutoNegotiation	Disable
3	Enable	AutoNegotiation	Disable
4	Enable	AutoNegotiation	Disable
5	Enable	AutoNegotiation	Disable
6	Enable	AutoNegotiation	Disable
7	Enable	AutoNegotiation	Disable
8	Enable	AutoNegotiation	Disable
9	Enable	AutoNegotiation	Disable
10	Enable	AutoNegotiation	Disable

Select the port you want to configure and make changes to the port.

In **State** column, you can enable or disable the state of this port. Once you disable, the port stop to link to the other end and stop to forward any traffic. The default setting is Enable which means all the ports are workable when you receive the device.

In **Speed/Duplex** column, you can configure port speed and duplex mode of this port. Below are the selections you can choose:

Fast Ethernet Port 1~7 (fa1~fa7) : AutoNegotiation, 10M Full Duplex(10 Full), 10M Half Duplex(10 Half), 100M Full Duplex(100 Full) and 100M Half Duplex(100 Half).

Gigabit Ethernet Port 8~10: (gi8~gi10) : AutoNegotiation, 10M Full Duplex(10 Full), 10M

Half Duplex(10 Half), 100M Full Duplex(100 Full), 100M Half Duplex(100 Half), 1000M Full Duplex(1000 Full), 1000M Half Duplex(1000 Half).

The default mode is Auto Negotiation mode.

In **Flow Control** column, “Symmetric” means that you need to activate the flow control function of the remote network device in order to let the flow control of that corresponding port on the switch to work. “Disable” means that you don’t need to activate the flow control function of the remote network device, as the flow control of that corresponding port on the switch will work anyway.

Once you finish configuring the settings, click on **Apply** to save the configuration.

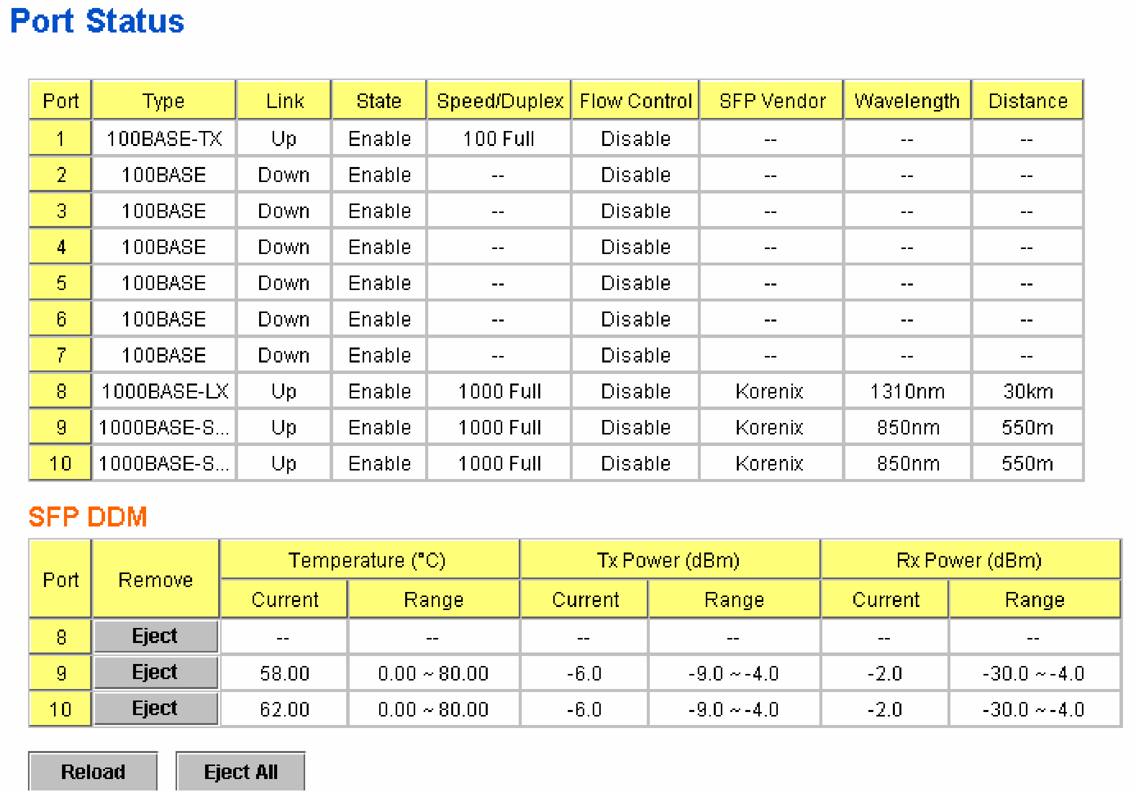
Technical Tips: *If both ends are not at the same speed, they can’t link with each other. If both ends are not in the same duplex mode, they will be connected by half mode.*

4.3.2 Port Status

Port Status shows you current port status.

In the firmware version 2.2, it supports Small Form Factory (SFP) fiber transceiver with Digital Diagnostic Monitoring (DDM) function that provides real time information of SFP transceiver and allows user to diagnostic the optical fiber signal received and launched.

The information of SFP DDM will listing on another table.



Port Status

Port	Type	Link	State	Speed/Duplex	Flow Control	SFP Vendor	Wavelength	Distance
1	100BASE-TX	Up	Enable	100 Full	Disable	--	--	--
2	100BASE	Down	Enable	--	Disable	--	--	--
3	100BASE	Down	Enable	--	Disable	--	--	--
4	100BASE	Down	Enable	--	Disable	--	--	--
5	100BASE	Down	Enable	--	Disable	--	--	--
6	100BASE	Down	Enable	--	Disable	--	--	--
7	100BASE	Down	Enable	--	Disable	--	--	--
8	1000BASE-LX	Up	Enable	1000 Full	Disable	Korenix	1310nm	30km
9	1000BASE-S...	Up	Enable	1000 Full	Disable	Korenix	850nm	550m
10	1000BASE-S...	Up	Enable	1000 Full	Disable	Korenix	850nm	550m

SFP DDM

Port	Remove	Temperature (°C)		Tx Power (dBm)		Rx Power (dBm)	
		Current	Range	Current	Range	Current	Range
8	Eject	--	--	--	--	--	--
9	Eject	58.00	0.00 ~ 80.00	-6.0	-9.0 ~ -4.0	-2.0	-30.0 ~ -4.0
10	Eject	62.00	0.00 ~ 80.00	-6.0	-9.0 ~ -4.0	-2.0	-30.0 ~ -4.0

The description of the columns is as below:

Port: Port interface number.

Type: 100TX -> Fast Ethernet port. 1000TX -> Gigabit Ethernet port.

Link: Link status. Up -> Link UP. Down -> Link Down.

State: Enable -> State is enabled. Disable -> The port is disable/shutdown.

Speed/Duplex: Current working status of the port.

Flow Control: The state of the flow control.

SFP Vendor: Vendor name of the SFP transceiver you plugged.

Wavelength: The wave length of the SFP transceiver you plugged.

Distance: The distance of the SFP transceiver you plugged.

Eject: Eject the DDM SFP transceiver. You can eject one port or eject all by click the icon "Eject All".

Temperature: The temperature spcific and current detected of DDM SFP transceiver.

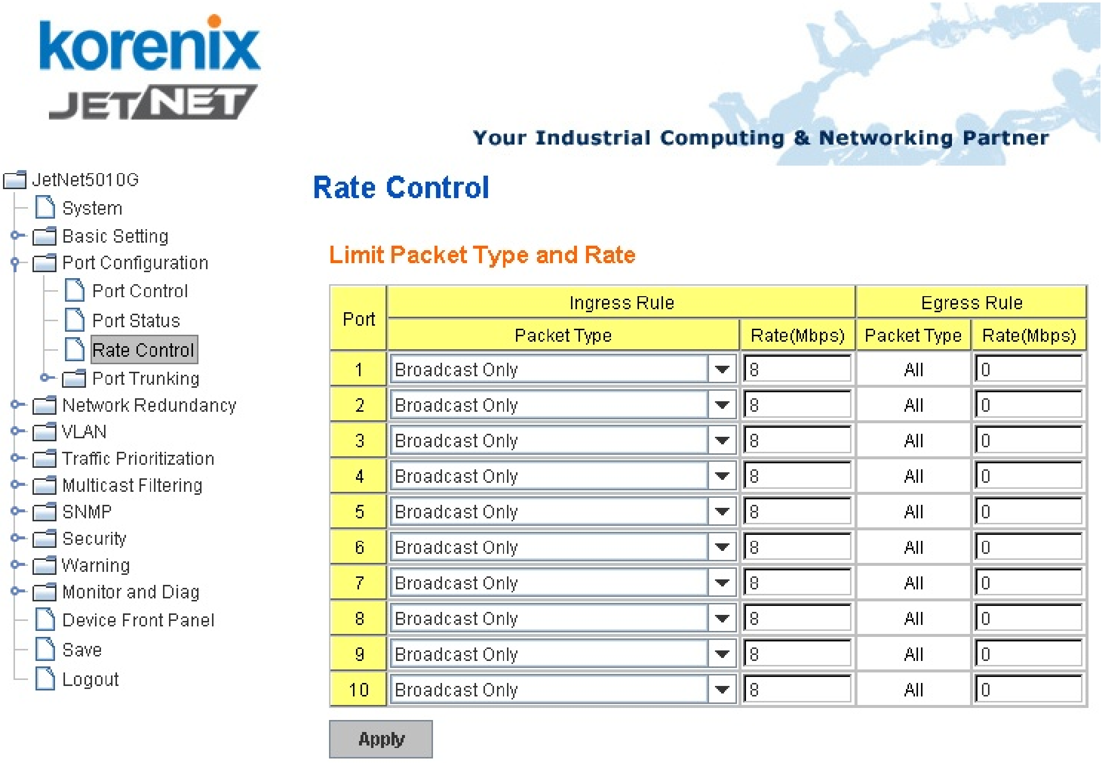
Tx Power (dBm): The specification and current transmit power of DDM SFP transceiver.

Rx Power (dBm): The specification and current received power of DDM SFP transceiver.

Note: 1. Most of the SFP transceivers provide vendor information which allows your switch to read it. The UI can display vendor name, wave length and distance of all Korenix SFP transceiver family. If you see Unknown info, it may mean that the vendor doesn't provide their information or that the information of their transceiver can't be read.

2. if the plugged DDM SFP transceiver is not certified by Korenix, the DDM function will not be supported. But the communication will not be disabled.

4.3.3 Rate Control



Rate Control

Limit Packet Type and Rate

Port	Ingress Rule		Egress Rule	
	Packet Type	Rate(Mbps)	Packet Type	Rate(Mbps)
1	Broadcast Only	8	All	0
2	Broadcast Only	8	All	0
3	Broadcast Only	8	All	0
4	Broadcast Only	8	All	0
5	Broadcast Only	8	All	0
6	Broadcast Only	8	All	0
7	Broadcast Only	8	All	0
8	Broadcast Only	8	All	0
9	Broadcast Only	8	All	0
10	Broadcast Only	8	All	0

Rate limiting is a form of flow control used to enforce a strict bandwidth limit at a port. You can program separate transmit (Egress Rule) and receive (Ingress Rule) rate limits at each port, and even apply the limit to certain packet types as described below.

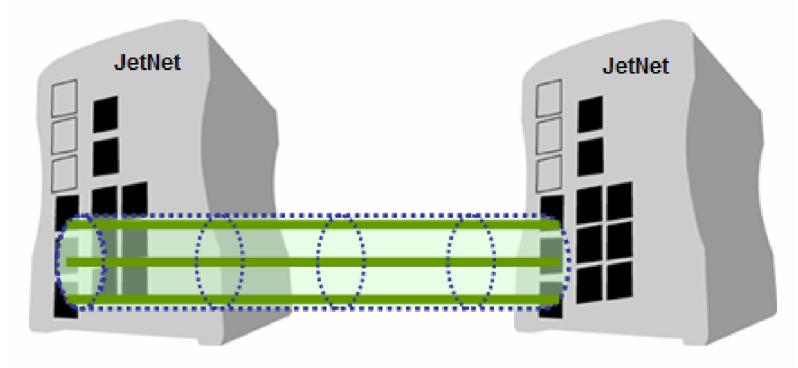
Packet type: You can select the packet type that you want to filter. The packet types of the Ingress Rule listed here include **Broadcast Only** / **Broadcast and multicast** / **Broadcast, Multicast and Unknown Unicast** or **All**. The packet types of the Egress Rule (outgoing) only support **all** packet types.

Rate: This column allows you to manually assign the limit rate of the port. Valid values are from 1Mbps-100Mbps for fast Ethernet ports and gigabit Ethernet ports. The step of the rate is 1 Mbps. Default value of Ingress Rule is “8” Mbps; default value of Egress Rule is 0 Mbps. 0 stands for disabling the rate control for the port.

Click on **Apply** to apply the configuration.

4.3.4 Port Trunking

Port Trunking configuration allows you to group multiple Ethernet ports in parallel to increase link bandwidth. The aggregated ports can be viewed as one physical port so that the bandwidth is higher than merely one single Ethernet port. The member ports of the same trunk group can balance the loading and backup for each other. Port Trunking feature is usually used when you need higher bandwidth for backbone network. This is an inexpensive way for you to transfer more data.

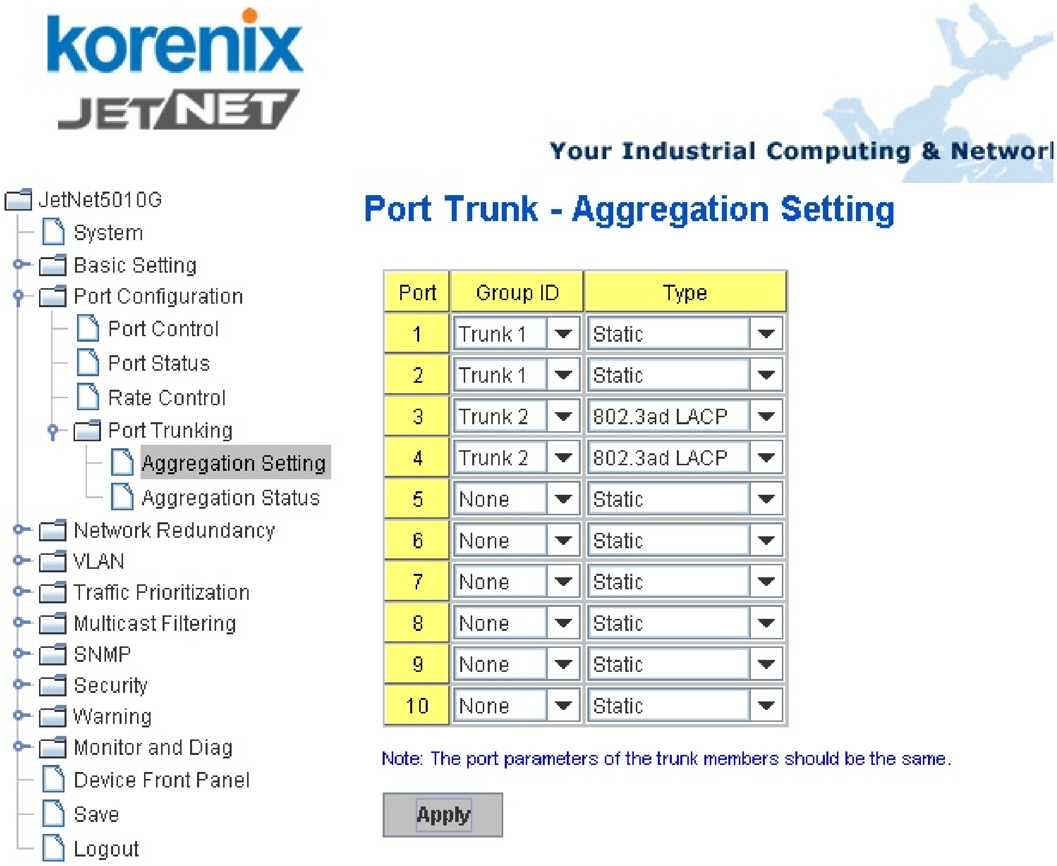


There are some different descriptions for the port trunking. Different manufacturers may use different descriptions for their products, like Link Aggregation Group (LAG), Link Aggregation Control Protocol, Ethernet Trunk, Ether Channel…etc. Most of the implementations now conform to IEEE standard, 802.3ad.

The aggregated ports can interconnect to the other switch which also supports Port Trunking. Korenix Supports 2 types of port trunking. One is Static Trunk, the other is 802.3ad. When the other end uses 802.3ad LACP, you **should** assign 802.3ad LACP to the trunk. When the other end uses non-802.3ad, you can then use Static Trunk.

There are 2 configuration pages, Aggregation Setting and Aggregation Status.

Aggregation Setting



Port Trunk - Aggregation Setting

Port	Group ID	Type
1	Trunk 1	Static
2	Trunk 1	Static
3	Trunk 2	802.3ad LACP
4	Trunk 2	802.3ad LACP
5	None	Static
6	None	Static
7	None	Static
8	None	Static
9	None	Static
10	None	Static

Note: The port parameters of the trunk members should be the same.

Trunk Size: The switch can support up to 5 trunk groups. Each trunk group can support up to 8 member ports. Since the member ports should use same speed/duplex, max groups for 100M ports would be 7, and 3 for gigabit ports.

Group ID: Group ID is the ID for the port trunking group. Ports with same group ID are in the same group.

Type: Static and **802.3ad LACP.** Each Trunk Group can only support Static or 802.3ad LACP. Choose the type you need here.

Extended setting in CLI: (Added in firmware V2.4)

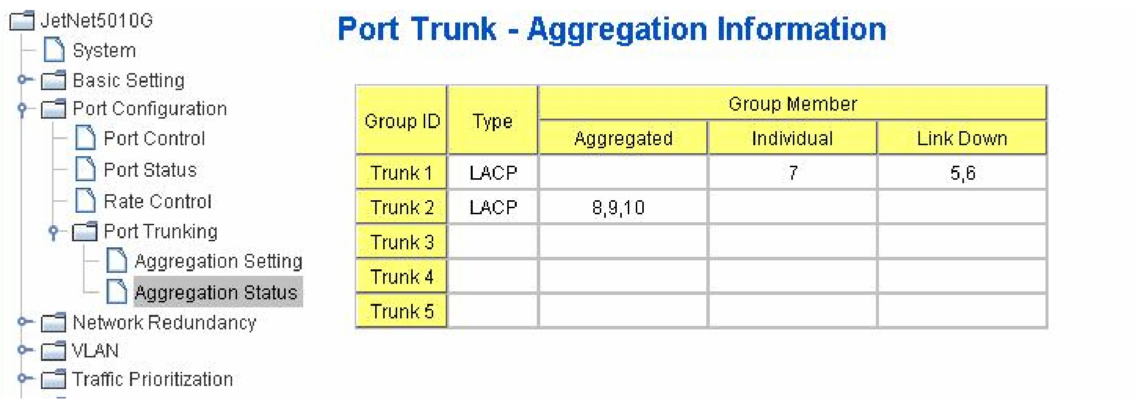
Port Priority: The command allows you to change the port priority setting of the specific port. LACP port priority is configured on each port using LACP. The port priority can be configured through the CLI. The higher the number, the lower the priority. The default value is 32768.

LACP Timeout: The LACPDU is generated and continue transmit within the LACP group. The interval time of the LACPDU Long timeout is 30 sec, this is default setting. The LACPDP Short timeout is 1 sec, the command to change from Long to Short is only applied to the CLI, the web GUI doesn’t support this. Once the LACP port doesn’t receive the LACPDP 3 times, that means the port may leave the group without earlier inform or does not detect by the switch, then the port will be removed from the group.

This command can be used when connect the switch by 2-port LACP through not-direct connected or shared media, like the Wireless AP or Hub. The end of the switch may not directly detect the failure, the LACP Short Timeout can detect the LACP group failure earlier within 3 seconds.

Aggregation Status

This page shows the status of port aggregation. Once the aggregation ports are negotiated well, you will see following status.



Port Trunk - Aggregation Information

Group ID	Type	Group Member		
		Aggregated	Individual	Link Down
Trunk 1	LACP		7	5,6
Trunk 2	LACP	8,9,10		
Trunk 3				
Trunk 4				
Trunk 5				

Group ID: Display Trunk 1 to Trunk 5 set up in Aggregation Setting.

Type: Static or LACP set up in Aggregation Setting.

Aggregated: When LACP links well, you can see the member ports in Aggregated column.

Individual: When LACP is enabled, member ports of LACP group which are not connected to correct LACP member ports will be displayed in the Individual column.

Link Down: When LACP is enabled, member ports of LACP group which are not linked up will be displayed in the Link Down column.

4.3.5 Command Lines for Port Configuration

Feature	Command Line
Port Control	
Port Control – State	Switch(config-if)# shutdown -> Disable port state Port1 Link Change to DOWN interface fastethernet1 is shutdown now. Switch(config-if)# no shutdown -> Enable port state Port1 Link Change to DOWN Port1 Link Change to UP interface fastethernet1 is up now. Switch(config-if)# Port1 Link Change to UP Switch(config)# sfp ddm Digital diagnostic and monitoring Switch(config)# sfp ddm Eject Reject DDM SFP Switch(config)# sfp ddm eject → eject SFP DDM transceiver all All DDM interface Example: Switch(config)# sfp ddm eject all

	DDM SFP on Port 9 normally ejected. DDM SFP on Port 9 normally ejected. All DDM SFP normally ejected. Switch(config)# interface gigabitethernet10 → eject port 10 SFP DDM transceiver. Switch(config-if)# sfp ddm eject DDM SFP on Port 10 normally ejected.
Port Control – Auto Negotiation	Switch(config)# interface fa1 Switch(config-if)# auto-negotiation Auto-negotiation of port 1 is enabled!
Port Control – Force Speed/Duplex	Switch(config-if)# speed 100 Port1 Link Change to DOWN set the speed mode ok! Switch(config-if)# Port1 Link Change to UP Switch(config-if)# duplex full Port1 Link Change to DOWN set the duplex mode ok! Switch(config-if)# Port1 Link Change to UP
Port Control – Flow Control	Switch(config-if)# flowcontrol on Flowcontrol on for port 1 set ok! Switch(config-if)# flowcontrol off Flowcontrol off for port 1 set ok!
Port Status	

Port Status	Switch# show interface fa1
	Interface fastethernet1
	  Administrative Status : Enable
	  Operating Status : Connected
	  Duplex : Full
	  Speed : 100
	  Flow Control :off
	  Default Port VLAN ID: 1
	  Ingress Filtering : Disabled
	  Acceptable Frame Type : All
	  Port Security : Disabled
	  Auto Negotiation : Disable
	  Loopback Mode : None
	  STP Status: forwarding
	  Default CoS Value for untagged packets is 0.
	  Mdix mode is Disable.
	  Medium mode is Copper.
	
	Switch# show sfp ddm →show SFP DDM information
	Port 8
	  Temperature:N/A
	  Tx power:N/A
	  Rx power:N/A
	Port 9
	  Temperature:64.00 C <range :0.0-80.00>
	  Tx power:-6.0 dBm <range : -9.0 - -4.0>
	  Rx power:-30.0 dBm <range: -30.0 - -4.0>
	Port 10

	Temperature:67.00 C <range :0.0-80.00> Tx power:-6.0 dBm <range : -9.0 - -4.0> Rx power:-2.0 dBm <range: -30.0 - -4.0> *Note: Administrative Status -> Port state of the port. Operating status -> Current status of the port. Duplex -> Duplex mode of the port. Speed -> Speed mode of the port. Flow control -> Flow Control status of the port.*
Rate Control	
Rate Control – Ingress or Egress	Switch(config-if)# rate-limit egress Outgoing packets ingress Incoming packets ***Note: To enable rate control, you should select the Ingress or Egress rule first; then assign the packet type and bandwidth.***
Rate Control – Filter Packet Type	Switch(config-if)# rate-limit ingress mode all Limit all frames broadcast Limit Broadcast frames flooded-unicast Limit Broadcast, Multicast and flooded unicast frames multicast Limit Broadcast and Multicast frames Switch(config-if)# rate-limit ingress mode broadcast Set the ingress limit mode broadcast ok.
Rate Control - Bandwidth	Switch(config-if)# rate-limit ingress bandwidth <0-100> Limit in magabits per second (0 is no limit) Switch(config-if)# rate-limit ingress bandwidth 8 Set the ingress rate limit 8Mbps for Port 1.
Port Trunking	
LACP	Switch(config)# lacp group 1 gi8-10 Group 1 based on LACP(802.3ad) is enabled! *Note: The interface list is fa1,fa3-5,gi8-10* Note: different speed port can't be aggregated together.
LACP – Port Setting Long/Short Timeout (New Feature in V2.4)	SWITCH(config-if)# lacp port-priority LACP priority for physical interfaces timeout assigns an administrative LACP timeout SWITCH(config-if)# lacp port-priority <1-65535> Valid port priority range 1 - 65535 (default is 32768) SWITCH(config-if)# lacp timeout long specifies a long timeout value (default) short specifies a short timeout value SWITCH(config-if)# lacp timeout short Set lacp port timeout ok.
Static Trunk	Switch(config)# trunk group 2 fa6-7 Trunk group 2 enable ok! Failure to configure due to the group ID is existed. SWITCH(config)# trunk group 1 fa11-12 Can't set trunk group 1 enable! The group 1 is a lacp enabled group! SWITCH(config)# trunk group 2 fa11-12 Can't set trunk group 2 enable! The group 2 is a static aggregation group.

Display - LACP

```
etNet 5010G# show lacp internal
LACP group 1 internal information:
        LACP Port     Admin       Oper        Port
Port    Priority       Key          Key          State
----- ----------- -------- -------- -------
    8               1            8            8      0x45
    9               1            9            9      0x45
   10               1           10           10      0x45

LACP group 2 is inactive
LACP group 3 is inactive
LACP group 4 is inactive
```

Display - Trunk

```
Switch# show trunk group 1
FLAGS:        I -> Individual              P -> In channel
              D -> Port Down

Trunk Group
GroupID   Protocol   Ports
--------+---------+------------------------------------
  1            LACP          8(D) 9(D) 10(D)
Switch# show trunk group 2
FLAGS:        I -> Individual              P -> In channel
              D -> Port Down

Trunk Group
GroupID   Protocol   Ports
--------+---------+------------------------------------
  2            Static       6(D) 7(P)
Switch#
```

4.4 Network Redundancy

It is critical for industrial applications that network remains non-stop. Korenix develps multiple kinds of standard (STP, RSTP and MSTP) and Korenix patterned redundancy protocol, Multiple Super Ring to remain the network redundancy can be protected well by Korenix switch.

JetNet 5010G v2.1 firmware supports standard STP/RSTP and Multiple Super Ring (MSR). The MSR includes Rapid Super Ring, Rapid Dual Homing, TrunkRing, MultiRing and backward compatible with Legacy Super Ring Client modes.

Additionally, the JetNet 5010G V2.4 firmawre start to support Multiple Spanning Tree Protocol (MSTP). This protocol is a direct extension of RSTP. It can provide an independent spanning tree for different VLANs. It simplifies network management, provides for even faster convergence than RSTP by limiting the size of each region, and prevents VLAN members from being segmented from the rest of the group (as sometimes occurs with IEEE 802.1D STP).

Multiple Super Ring (MSR) technology is *Korenix's* 3rd generation Ring redundancy technology. This is patented and protected by *Korenix* and is used in countries all over the world. MSR ranks the fastest restore and failover time in the world, 0 ms for restore and about 5 milliseconds for failover for copper.

The single Korenix switch can aggregate multiple Rings within one switch. All the ports can be configured as the ring port of a ring, each ring has its own Ring ID and the Ring ID will be added to the watchdog packet to monitor the ring status. This is Korenix Patterned MultiRing Technology.

The Ring ports can be LACP/Port Trunking ports, after aggregated ports to a group, the group of ports can act as the Ring port of the Ring. This is Korenix Pattened TrunkRing Technology.

Advanced Rapid Dual Homing(RDH) technology also facilitates *JetNet 5010G* to connect with a core managed switch easily and conveniently. With RDH technology, you can also couple several Rapid Super Rings or RSTP cloud together, which is also known as Auto Ring Coupling.

To become backwards compatible with the Legacy Super Ring technology implemented in *JetNet 4000/4500* switches, *JetNet 5010G* also supports Super Ring Client mode. The Super Ring ports can pass through Super Ring control packets extremely well and works with Super Ring.

Following commands are included in this group:

4.4.1 STP Configuration

4.4.2 STP Port Configuration

4.4.3 STP Information

4.4.4 MSTP Configuration

4.4.5 MSTP Port Configuration

4.4.6 MSTP information

4.4.7 Multiple Super Ring

4.4.8 Multiple Super Ring Information

4.4.9 Command Lines for Network Redundancy

The new Network Redundancy Configuration/Information tree of Web UI is applied to the **JetNet 5010G/4510 firmware V2.4.**

The **STP Configuraiton, STP Port Configuration and STP Information** pages are available while select the **STP and RSTP** mode.
The **MSTP Configuraiton, MSTP Port Configuration and MSTP Information** pages are available while select the **MSTP** mode.
The **Multiple Super Ring and Multiple Super Ring Information** are available while select the **MSR** mode.

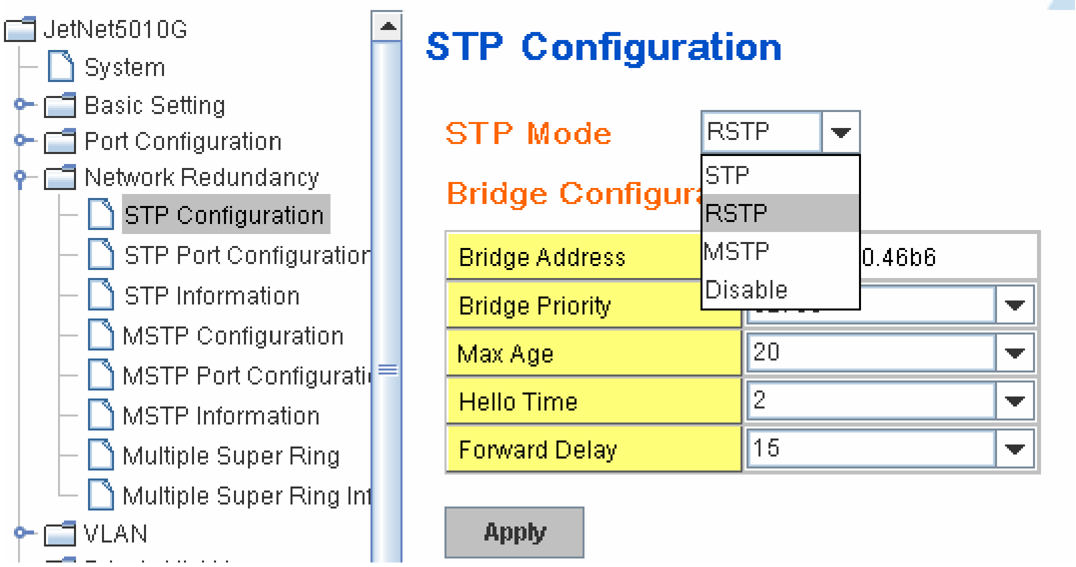
4.4.1 STP Configuration

This page allows select the STP mode and configuring the global STP/RSTP Bridge Configuraiton.

The STP mode includes the **STP**, **RSTP**, **MSTP** and **Disable**. Please select the STP mode for your system first. The default mode is RSTP enabled.

Afte select the STP or RSTP mode, continue to configure the gloable Bridge parameters for STP and RSTP.

After select the MSTP mode, please go to MSTP Configuration page.



STP Configuration

STP Mode: RSTP

Bridge Configur

Bridge Address	0.46b6
Bridge Priority	
Max Age	20
Hello Time	2
Forward Delay	15

RSTP (Refer to the 4.4.1 of previous version manual.)

RSTP is the abbreviation of Rapid Spanning Tree Protocol. If a switch has more than one path to a destination, it will lead to message loops that can generate broadcast storms and quickly bog down a network. The spanning tree was created to combat the negative effects of message loops in switched networks. A spanning tree uses a spanning tree algorithm (STA) to automatically sense whether a switch has more than one way to communicate with a node. It will then select the best path (primary), and block the other path(s). It will also keep track of the blocked path(s) in case the primary path fails. Spanning Tree Protocol (STP) introduced a standard method to accomplish this. It is specified in IEEE 802.1D-1998. Later, Rapid Spanning Tree Protocol (RSTP) was adopted and represents the evolution of STP, providing much faster spanning tree convergence after a topology change. This is specified in IEEE 802.1w. In 2004, 802.1w is included into 802.1D-2004 version. This switch supports both RSTP and STP (all switches that support RSTP are also backward compatible with switches that support only STP).

Bridge Configuration

Bridge Address: This shows the switch's MAC address.

Priority (0-61440): RSTP uses bridge ID to determine the root bridge, the bridge with the highest bridge ID becomes the root bridge. The bridge ID is composed of bridge priority and bridge MAC address. So that the bridge with the highest priority becomes the highest bridge ID. If all the bridge ID has the same priority, the bridge with the lowest MAC address will then become the root bridge.

Note: The bridge priority value must be in multiples of 4096. A device with a lower number has a higher bridge priority. Ex: 4096 is higher than 32768.

Note: The Web GUI allows user select the priority number directly. This is the convinent of the GUI design. When you configure the value through the CLI or SNMP, you may need to type the value directly. Please follow the n x 4096 ruls for the Bridge Priority.

Max Age (6-40): Enter a value from 6 to 40 seconds here. This value represents the time that a bridge will wait without receiving Spanning Tree Protocol configuration messages before attempting to reconfigure.

If JetNet is not the root bridge, and if it has not received a hello message from the root bridge in an amount of time equal to Max Age, then JetNet will reconfigure itself as a root bridge. Once two or more devices on the network are recognized as a root bridge, the devices will renegotiate to set up a new spanning tree topology.

Hello Time (1-10): Enter a value from 1 to 10 seconds here. This is a periodic timer that drives the switch to send out BPDU (Bridge Protocol Data Unit) packet to check current STP status.

The root bridge of the spanning tree topology periodically sends out a "hello" message to other devices on the network to check if the topology is "healthy". The "hello time" is the amount of time the root has waited during sending hello messages.

Forward Delay Time (4-30): Enter a value between 4 and 30 seconds. This value is the time that a port waits before changing from Spanning Tree Protocol learning and listening states to forwarding state.

This is the amount of time JetNet will wait before checking to see if it should be changed to a different state.

Once you have completed your configuration, click on **Apply** to apply your settings.

Note: You must observe the following rule to configure Hello Time, Forwarding Delay, and Max Age parameters.

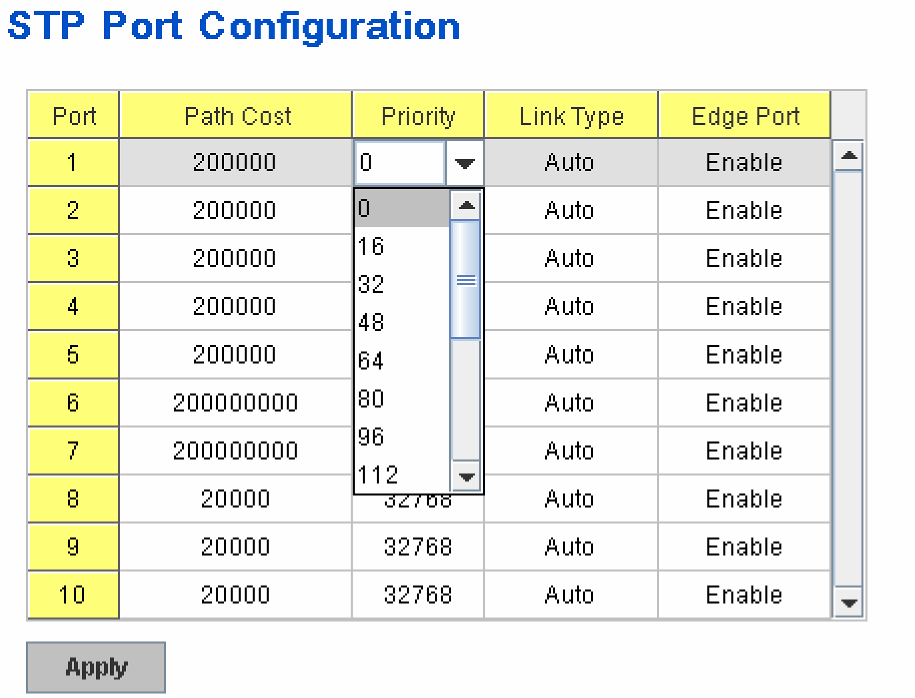
2 × (Forward Delay Time – 1 sec) ≥ Max Age Time ≥ 2 × (Hello Time value + 1 sec)

4.4.2 STP Port Configuration

This page allows you to configure the port parameter after enabled STP or RSTP.

Port Configuration

Select the port you want to configure and you will be able to view current settings and status of the port.



STP Port Configuration

Port	Path Cost	Priority	Link Type	Edge Port
1	200000	0	Auto	Enable
2	200000		Auto	Enable
3	200000		Auto	Enable
4	200000		Auto	Enable
5	200000		Auto	Enable
6	200000000		Auto	Enable
7	200000000		Auto	Enable
8	20000	32768	Auto	Enable
9	20000	32768	Auto	Enable
10	20000	32768	Auto	Enable

Path Cost: Enter a number between 1 and 200,000,000. This value represents the “cost” of the path to the other bridge from the transmitting bridge at the specified port.

Priority: Enter a value between 0 and 240, using multiples of 16. This is the value that decides which port should be blocked by priority in a LAN.

Link Type: There are 3 types for you select. **Auto, P2P** and **Share.**

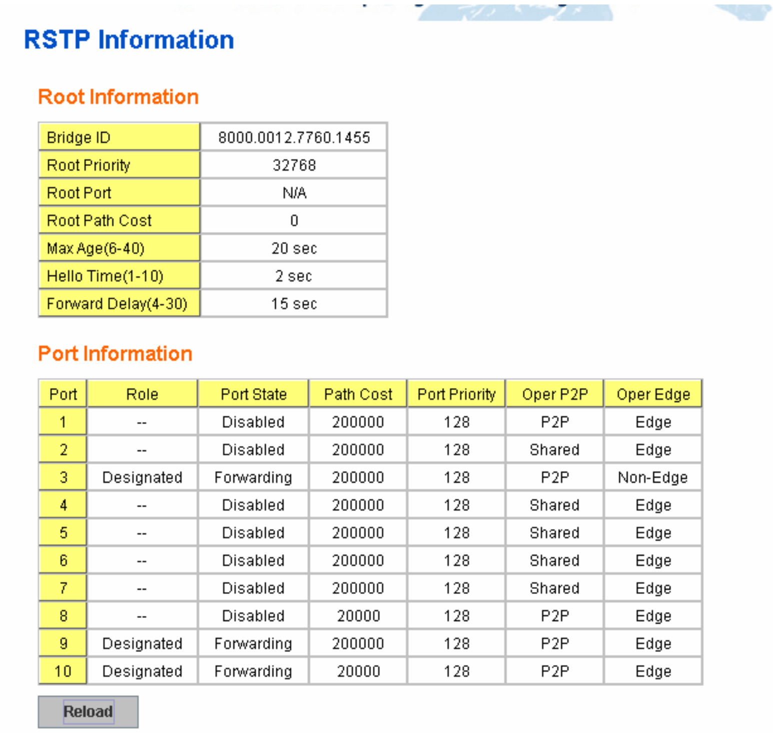
Some of the rapid state transitions that are possible within RSTP depend upon whether the port of concern can only be connected to another bridge (i.e. it is served by a point-to-point LAN segment), or if it can be connected to two or more bridges (i.e. it is served by a shared-medium LAN segment). This function allows link status of the link to be manipulated administratively. “**Auto**” means to auto select P2P or Share mode. “**P2P”** means P2P is enabled, the 2 ends work in Full duplex mode. While “**Share”** is enabled, it means P2P is disabled, the 2 ends may connect through a share media and work in Half duplex mode.

Edge: A port directly connected to the end stations cannot create a bridging loop in the network. To configure this port as an edge port, set the port to the **Enable** state. When the non-bridge device connects an admin edge port, this port will be in blocking state and turn to forwarding state in 4 seconds.

Once you finish your configuration, click on **Apply** to save your settings.

4.4.3 RSTP Info (The same as 4.4.2 of previous version manual.)

This page allows you to see the information of the root switch and port status.



RSTP Information

Root Information

Bridge ID	8000.0012.7760.1455
Root Priority	32768
Root Port	N/A
Root Path Cost	0
Max Age(6-40)	20 sec
Hello Time(1-10)	2 sec
Forward Delay(4-30)	15 sec

Port Information

Port	Role	Port State	Path Cost	Port Priority	Oper P2P	Oper Edge
1	--	Disabled	200000	128	P2P	Edge
2	--	Disabled	200000	128	Shared	Edge
3	Designated	Forwarding	200000	128	P2P	Non-Edge
4	--	Disabled	200000	128	Shared	Edge
5	--	Disabled	200000	128	Shared	Edge
6	--	Disabled	200000	128	Shared	Edge
7	--	Disabled	200000	128	Shared	Edge
8	--	Disabled	20000	128	P2P	Edge
9	Designated	Forwarding	200000	128	P2P	Edge
10	Designated	Forwarding	20000	128	P2P	Edge

Root Information: You can see root Bridge ID, Root Priority, Root Port, Root Path Cost and the Max Age, Hello Time and Forward Delay of BPDU sent from the root switch.

Port Information: You can see port Role, Port State, Path Cost, Port Priority, Oper P2P mode, Oper edge port mode and Aggregated(ID/Type).

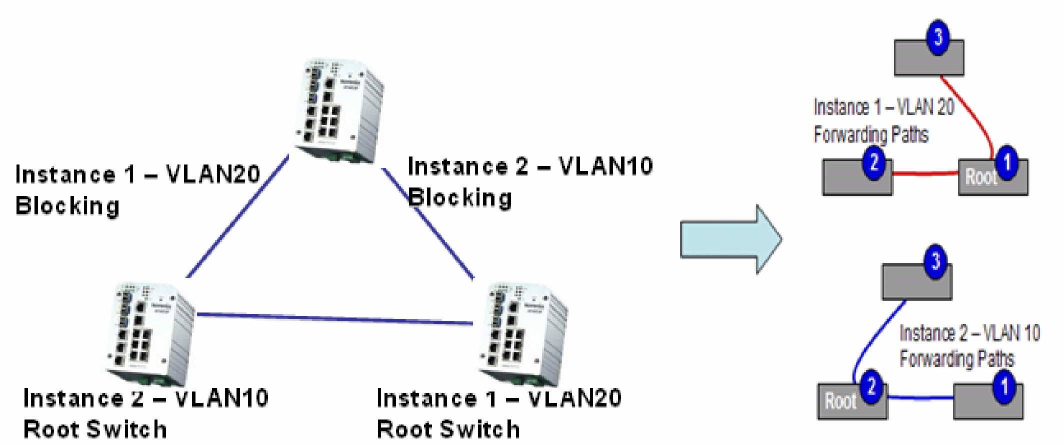
4.4.4 MSTP (Multiple Spanning Tree Protocol) Configuration

MSTP is the abbreviation of Multiple Spanning Tree Protocol. This protocol is a direct extension of RSTP. It can provide an independent spanning tree for different VLANs. It simplifies network management, provides for even faster convergence than RSTP by limiting the size of each region, and prevents VLAN members from being segmented from the rest of the group (as sometimes occurs with IEEE 802.1D STP).

While using MSTP, there are some new concepts of network architecture. A switch may belong to different groups, act as root or designate switch, generate BPDU for the network to maintain the forwarding table of the spanning tree. With MSTP can also provide multiple forwarding paths and enable load balancing. Understand the architecture allows you to maintain the correct spanning tree and operate effectively.

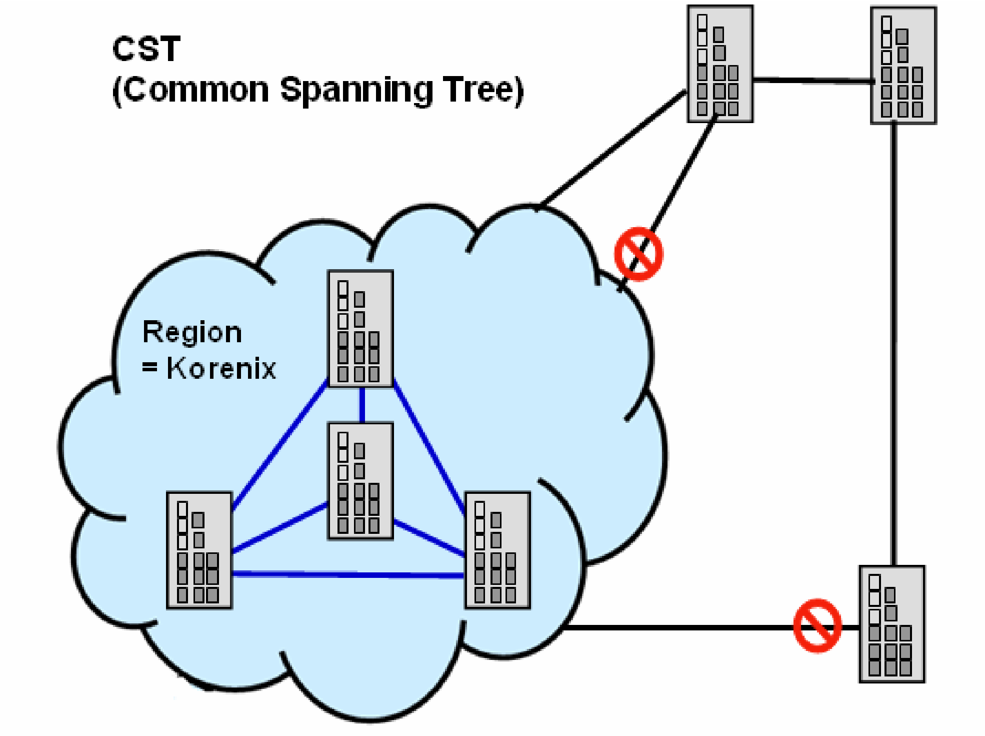
One VLAN can be mapped to a Multiple Spanning Tree Instance (MSTI). The miximum Instance JetNet 5010G supports is 16, range from 0-15. The MSTP builds a separate Multiple Spanning Tree (MST) for each instance to maintain connectivity among each of the assigned VLAN groups. An Internal Spanning Tree (IST) is used to connect all the MSTP switches within an MST region. An MST Region may contain multiple MSTP Instances.

The figure shows there are 2 VLANs/MSTP Instances and each instance has its Root and forwarding paths.

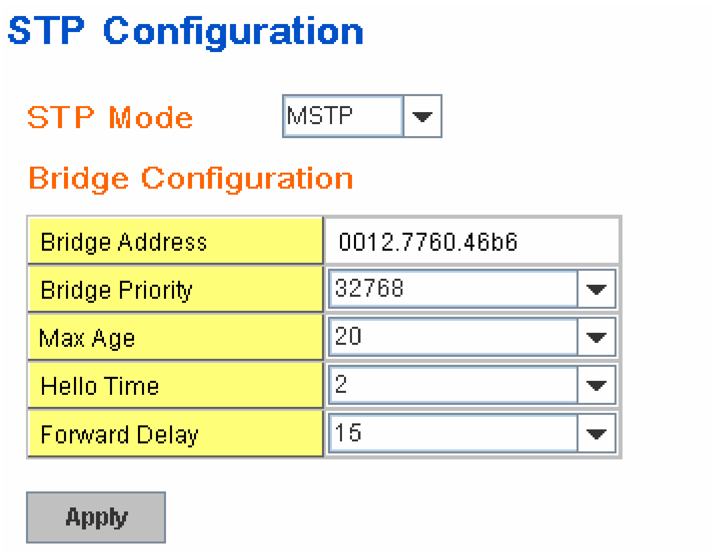


A Common Spanning Tree (CST) interconnects all adjuacent MST regions and acts as a virtual bridge node for communications with STP or RSTP nodes in the global network. MSTP connects all bridges and LAN segments with a single Common and Internal Spanning Tree (CIST). The CIST is formed as a result of the running spanning tree algorithm between switches that support the STP, RSTP, MSTP protocols.

The figure shows the CST large network. In this network, a Region may has different instances and its own forwarding path and table, however, it acts as a single Brige of CST.



To configure the MSTP setting, the STP Mode of the STP Configuration page should be changed to MSTP mode first.



STP Configuration

STP Mode: MSTP

Bridge Configuration

Bridge Address	0012.7760.46b6
Bridge Priority	32768
Max Age	20
Hello Time	2
Forward Delay	15

After enabled MSTP mode, then you can go to the MSTP Configuraiton pages.

MSTP Region Configuration

This page allows configure the Region Name and its Revision, mapping the VLAN to Instance and check current MST Instance configuration. The network can be divided virtually to different Regions. The switches within the Region should have the same Region and Revision leve.

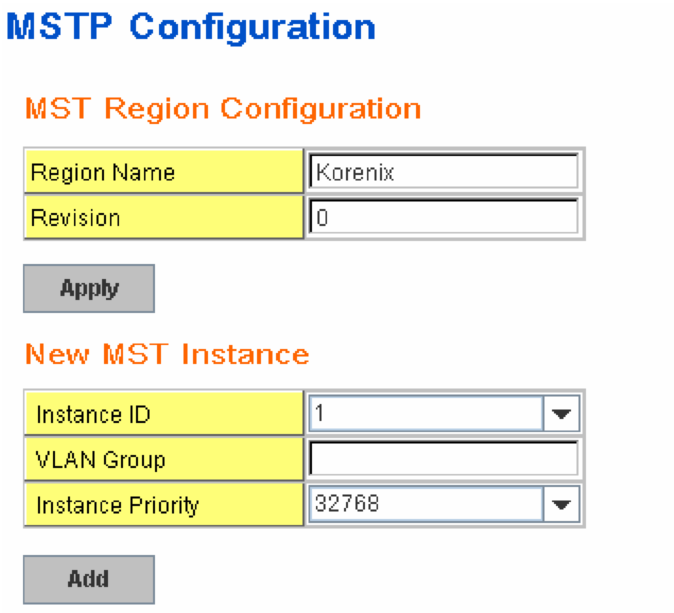
Region Name: The name for the Region. Maximum length: 32 characters.

Revision: The revision for the Region. Range: 0-65535; Default: 0)

Once you finish your configuration, click on **Apply** to apply your settings.

New MST Instance

This page allows mapping the VLAN to Instance and assign priority to the instance. Before mapping VLAN to Instance, you should create VLAN and assign the member ports first. Please refer to the VLAN setting page.



MSTP Configuration

MST Region Configuration

Region Name	Korenix
Revision	0

New MST Instance

Instance ID	1
VLAN Group	
Instance Priority	32768

Instance ID: Select the Instance ID, the available number is 1-15.

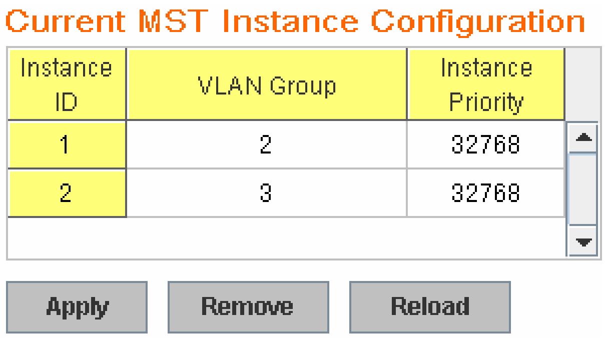
VLAN Group: Type the VLAN ID you want mapping to the instance.

Instance Priority: Assign the priority to the instance.

After finish your configuration, click on **Add** to apply your settings.

Current MST Instance Configuration

This page allows you to see the current MST Instance Configuration you added. Click on "**Apply**" to apply the setting. You can "**Remove"** the instance or "**Reload**" the configuration display in this page.



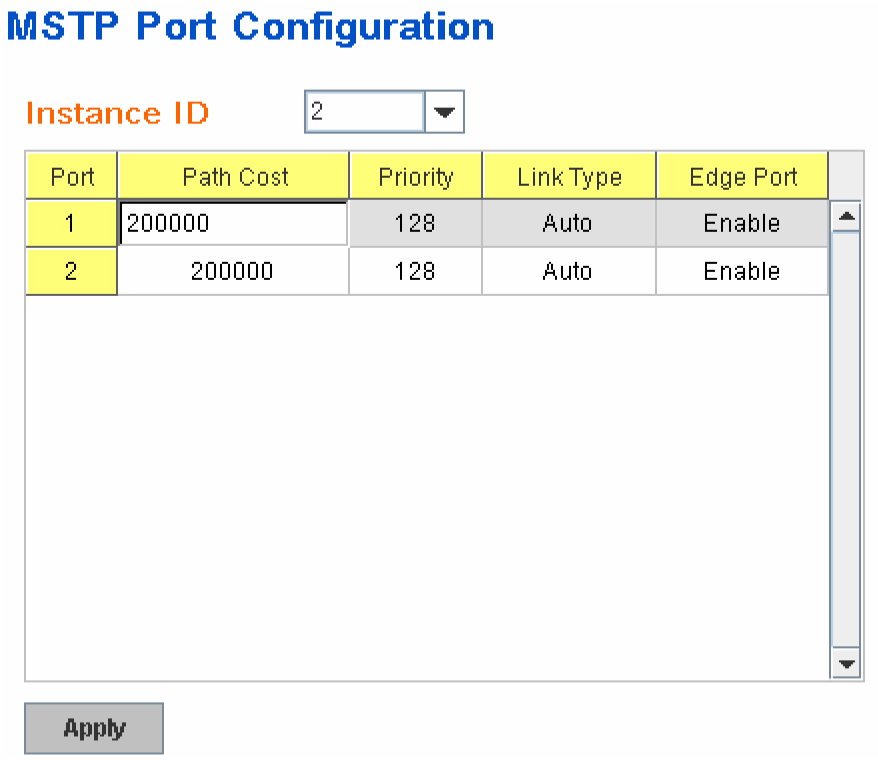
Current MST Instance Configuration

Instance ID	VLAN Group	Instance Priority
1	2	32768
2	3	32768

4.4.5 MSTP Port Configuration

This page allows configure the Port settings. Choose the Instance ID you want to configure. The MSTP enabled and linked up ports within the instance will be listed in this table.

Note that the ports not belonged to the Instance, or the ports not MSTP activated will not display. The meaning of the Path Cost, Priority, Link Type and Edge Port is the same as the definition of RSTP.



MSTP Port Configuration

Instance ID: 2

Port	Path Cost	Priority	Link Type	Edge Port
1	200000	128	Auto	Enable
2	200000	128	Auto	Enable

Path Cost: Enter a number between 1 and 200,000,000. This value represents the “cost” of the path to the other bridge from the transmitting bridge at the specified port.

Priority: Enter a value between 0 and 240, using multiples of 16. This is the value that decides which port should be blocked by priority in a LAN.

Link Type: There are 3 types for you select. **Auto, P2P** and **Share.**

Some of the rapid state transitions that are possible within RSTP depend upon whether the port of concern can only be connected to another bridge (i.e. it is served by a point-to-point LAN segment), or if it can be connected to two or more bridges (i.e. it is served by a shared-medium LAN segment). This function allows link status of the link to be manipulated administratively. “**Auto**” means to auto select P2P or Share mode. “**P2P”** means P2P is enabled, the 2 ends work in Full duplex mode. While “**Share”** is enabled, it means P2P is disabled, the 2 ends may connect through a share media and work in Half duplex mode.

Edge: A port directly connected to the end stations cannot create a bridging loop in the network. To configure this port as an edge port, set the port to the **Enable** state. When the non-bridge device connects an admin edge port, this port will be in blocking state and turn to forwarding state in 4 seconds.

Once you finish your configuration, click on **Apply** to save your settings.

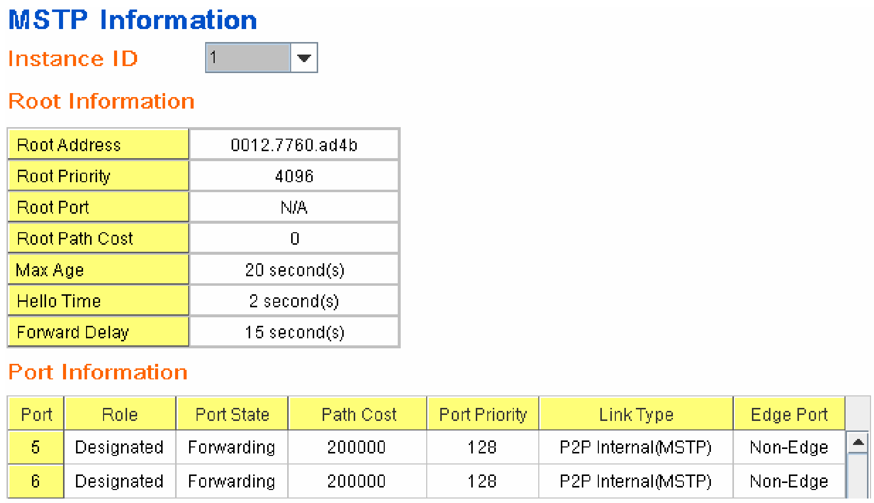
4.4.6 MSTP Information

This page allows you to see the current MSTP information.

Choose the **Instance ID** first. If the instance is not added, the information remains blank.

The **Root Information** shows the setting of the Root switch.

The **Port Information** shows the port setting and status of the ports within the instance.



MSTP Information

Instance ID 1

Root Information

Root Address	0012.7760.ad4b
Root Priority	4096
Root Port	N/A
Root Path Cost	0
Max Age	20 second(s)
Hello Time	2 second(s)
Forward Delay	15 second(s)

Port Information

Port	Role	Port State	Path Cost	Port Priority	Link Type	Edge Port
5	Designated	Forwarding	200000	128	P2P Internal(MSTP)	Non-Edge
6	Designated	Forwarding	200000	128	P2P Internal(MSTP)	Non-Edge

Click on “**Reload**“ to reload the MSTP information display.

4.4.7 Multiple Super Ring (MSR) (The same as 4.4.31 of previous version manual.)

The most common industrial network redundancy is to form a ring or loop. Typically, the managed switches are connected in series and the last switch is connected back to the first one. In such connection, you can implement Korenix Multiple Super Ring technology to get fatest recovery performance.

Multiple Super Ring (MSR) technology is *Korenix's* 3rd generation Ring redundancy technology. This is patented and protected by *Korenix* and is used in countries all over the world. MSR ranks the fastest restore and failover time in the world, 0 ms for restore and about milliseconds level for failover for 100Base-TX copper port. The other interface may take longer time due to the media characteristics.

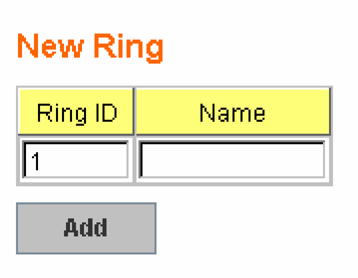
Advanced **Rapid Dual Homing (RDH)** technology also facilitates *JetNet Managed Switch* to connect with a core managed switch easily and conveniently. With RDH technology, you can also couple several Rapid Super Rings or RSTP cloud together, which is also known as Auto Ring Coupling.

TrunkRing technology allows integrate MSR with LACP/Port Trunking. The LACP/Trunk aggregated ports is a virtual interface and it can work as the Ring port of the MSR.

MultiRing is an outstanding technology Korenix can support. Multiple rings can be aggregated within one switch by using different Ring ID. The maximum Ring number one switch can support is half of total port volume. For example, the JetNet 5010G is a 7+3G port design, that means maximum 5 Rings (4 x 100M Rings and 1 Gigabit Rings) can be aggregated to one JetNet 5010G. The feature saves much effort when constructing complex network architecture.

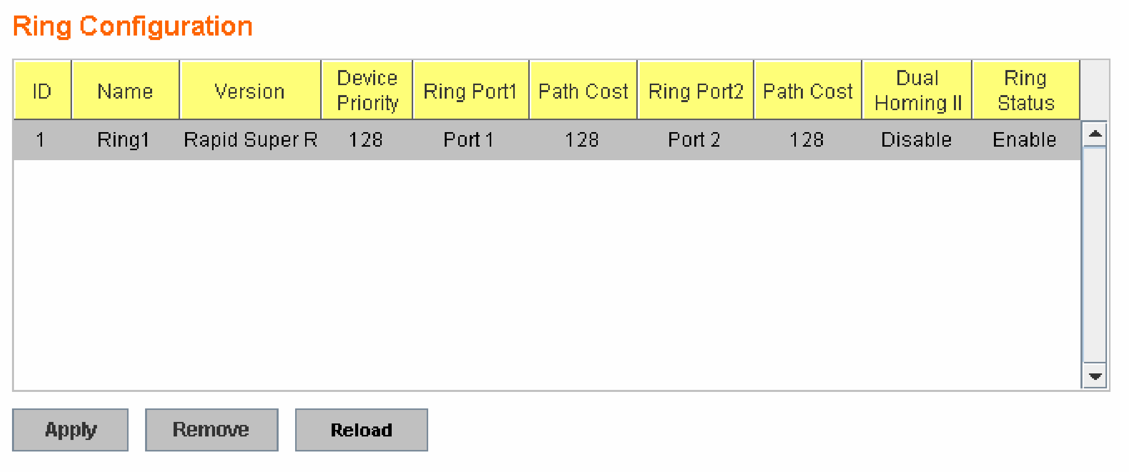
To become backwards compatible with the Legacy Super Ring technology implemented in *JetNet 4008/4508* V1 series switches, *JetNet 4510/4518/5000 Series* also supports Super Ring Client mode. The Super Ring ports can pass through Super Ring control packets extremely well and works with Super Ring.

New Ring: To create a Rapdis Super Ring. Jjust fill in the Ring ID which has range from 0 to 31. If the name field is left blank, the name of this ring will be automatically naming with Ring ID.



New Ring

Ring ID	Name
1	



Ring Configuration

ID	Name	Version	Device Priority	Ring Port1	Path Cost	Ring Port2	Path Cost	Dual Homing II	Ring Status
1	Ring1	Rapid Super R	128	Port 1	128	Port 2	128	Disable	Enable

Ring Configuration

ID: Once a Ring is created, This appears and can not be changed.

Name: This field will show the name of the Ring. If it is not filled in when creating, it will be automatically named by the rule “RingID”.

Version: The version of Ring can be changed here. There are three modes to choose: Rapid Super Ring as default; Super ring for compatible with Korenix 1st general ring and Any Ring for compatible with other version of rings.

Device Priority: The switch with highest priority (highest value) will be automatically selected as Ring Master. Then one of the ring ports in this switch will become forwarding port and the other one will become blocking port. If all of the switches have the same priority, the switch with the biggest MAC address will be selected as Ring Master.

Ring Port1: In Rapid Super Ring environment, you should have 2 Ring Ports. No matter this switch is Ring Master or not, when configuring RSR, 2 ports should be selected to be Ring Ports. For Ring Master, one of the ring ports will become the forwarding port and the other one will become the blocking port.

Path Cost: Change the Path Cost of Ring Port1. If this switch is the Ring Master of a Ring, then it determines the blocking port. The Port with higher Path Cost in the two ring Port will become the blocking port, If the Path Cost is the same, the port with larger port number will become the blocking port.

Ring Port2: Assign another port for ring connection

Path Cost: Change the Path Cost of Ring Port2

Rapid Dual Homing: Rapid Dual Homing is an important feature of Korenix 3rd generation Ring redundancy technology. When you want to connect multiple RSR or form redundant topology with other vendors,RDH could allow you to have maximum 7 multiple links for redundancy without any problem.

In Dual Homing I released with JetNet 4000/4500 series, you have to configure additional port as Dual Homing port to two uplink switches. In Rapid Dual Homing, you don’t need to configure specific port to connect to other protocol. The Rapid Dual Homing will smartly choose the fastest link for primary link and block all the other link to avoid loop. If the primary link failed, Rapid Dual Homing will automatically forward the secondary link for network redundant. Of course, if there are more connections, they will be standby links and recover one of then if both primary and secondary links are broken.

Ring status: To enable/disable the Ring. Please remember to enable the ring after you add it.

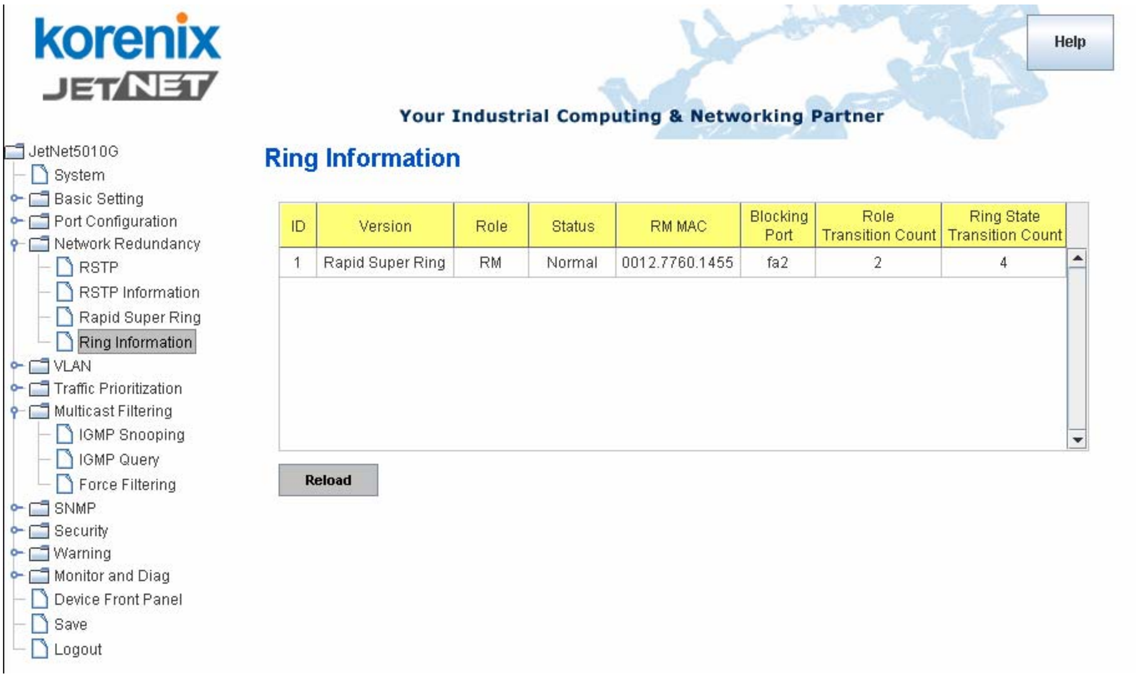
MultiRing: The MultiRing technology is one of the pattern of the MSR technology, the technology allows you to aggregate multiple rings within one switch. Create multiple ring ID and assign different ring port 1 and port 2 to each ring, thus the switch can have multiple rings in one JetNet 5428G.

When implementing MultiRing, remember that the different rings can NOT use the same ring ID. The other settings are the same as above description. Technically, the maximum ring volume the MultiRing supported is up to 16 rings. Due to the power volume limitation, the mximum volue is half of the port volume of a switch.

TrunkRing: The MultiRing technology is part of the MSR technology which combines the MSR with the port trunking technology. After multiple ports aggregated, this is so-call port trunking (Staticly or learnt by LACP protocol), the Trunk ID can be one of the port ID of the MSR technology. Configured the port trunking first then you can add the Trunk group as a Ring Port in managed switch.

4.4.8 Ring Info (The same as 4.4.4 of previous version manual.)

This page shows the RSR information.



Ring Information

ID	Version	Role	Status	RM MAC	Blocking Port	Role Transition Count	Ring State Transition Count
1	Rapid Super Ring	RM	Normal	0012.7760.1455	fa2	2	4

ID: Ring ID.

Version: which version of this ring, this field could be Rapid Super Ring, Super Ring, or Any Ring

Role: This Switch is RM or nonRM

Status: If this field is Normal which means the redundancy is approved. If any one of the link in this Ring is broken, then the status will be Abnormal.

RM MAC: The MAC address of Ring Master of this Ring. It helps to find the redundant path.

Blocking Port: This field shows which is blocked port of RM.

Role Transition Count: This means how many times this switch has changed its Role from nonRM to RM or from RM to nonRM.

Role state Transition Count: This number means how many times the Ring status has been transformed between Normal and Abnormal state.

4.4.9 Command Lines: (The chapter 4.4.5 of previous version manual.)

Feature	**Command Line**
Global (STP, RSTP, MSTP)	
Enable	Switch(config)# spanning-tree enable
Disable	Switch (config)# spanning-tree disable
Mode (Choose the Spanning Tree mode)	Switch(config)# spanning-tree mode rst the rapid spanning-tree protocol (802.1w) stp the spanning-tree prtotcol (802.1d) mst the multiple spanning-tree protocol (802.1s)
Bridge Priority	Switch(config)# spanning-tree priority <0-61440> valid range is 0 to 61440 in multiple of 4096 Switch(config)# spanning-tree priority 4096
Bridge Times	Switch(config)# spanning-tree bridge-times (forward Delay) (max-age) (Hello Time) Switch(config)# spanning-tree bridge-times 15 20 2 This command allows you configure all the timing in one time.
Forward Delay	Switch(config)# spanning-tree forward-time <4-30> Valid range is 4~30 seconds Switch(config)# spanning-tree forward-time 15
Max Age	Switch(config)# spanning-tree max-age <6-40> Valid range is 6~40 seconds Switch(config)# spanning-tree max-age 20
Hello Time	Switch(config)# spanning-tree hello-time <1-10> Valid range is 1~10 seconds Switch(config)# spanning-tree hello-time 2
MSTP	
Enter the MSTP Configuration Tree	Switch(config)# spanning-tree mst MSTMAP the mst instance number or range configuration enter mst configuration mode forward-time the forward dleay time hello-time the hello time max-age the message maximum age time max-hops the maximum hops sync sync port state of exist vlan entry Switch(config)# spanning-tree mst configuration Switch(config)# spanning-tree mst configuration Switch(config-mst)# abort exit current mode and discard all changes end exit current mode, change to enable mode and apply all changes exit exit current mode and apply all changes instance the mst instance list Print command list name the name of mst region no Negate a command or set its defaults

	quit exit current mode and apply all changes revision the revision of mst region show show mst configuration
Region Configuration	Region Name: Switch(config-mst)# name NAME the name string Switch(config-mst)# name korenix Region Revision: Switch(config-mst)# revision <0-65535> the value of revision Switch(config-mst)# revision 65535
Mapping Instance to VLAN (Ex: Mapping VLAN 2 to Instance 1)	Switch(config-mst)# instance <1-15> target instance number Switch(config-mst)# instance 1 vlan VLANMAP target vlan number(ex.10) or range(ex.1-10) Switch(config-mst)# instance 1 vlan 2
Display Current MST Configuraion	Switch(config-mst)# show current Current MST configuration Name [korenix] Revision 65535 Instance Vlans Mapped -------- ------------------------------------- 0 1,4-4094 1 2 2 3 --- Config HMAC-MD5 Digest: 0xB41829F9030A054FB74EF7A8587FF58D ---
Remove Region Name	Switch(config-mst)# no name name configure revision revision configure instance the mst instance Switch(config-mst)# no name
Remove Instance example	Switch(config-mst)# no instance <1-15> target instance number Switch(config-mst)# no instance 2
Show Pending MST Configuration	Switch(config-mst)# show pending Pending MST configuration Name [] (->The name is removed by no name) Revision 65535 Instance Vlans Mapped -------- ------------------------------------- 0 1,3-4094 1 2 (->Instance 2 is removed by no instance 2) --- Config HMAC-MD5 Digest: 0x3AB68794D602FDF43B21C0B37AC3BCA8 ---
Apply the setting and go to the configuration mode	Switch(config-mst)# quit apply all mst configuration changes Switch(config)#
Apply the setting and go to the global mode	Switch(config-mst)# end apply all mst configuration changes Switch#
Abort the Setting and go to the	Switch(config-mst)# abort discard all mst configuration changes

configuration mode. Show Pending to see the new settings are not applied.	Switch(config)# spanning-tree mst configuration Switch(config-mst)# show pending Pending MST configuration Name [korenix] (->The nameis not applied after Abort settings.) Revision 65535 Instance Vlans Mapped -------- -------------------------------------- 0 1,4-4094 1 2 2 3 (-> The instance is not applied after Abort settings.) -- Config HMAC-MD5 Digest: 0xB41829F9030A054FB74EF7A8587FF58D --
RSTP	
System RSTP Setting	The mode should be rst, the timings can be configured in global settings listed in above.
Port Configuration Mode	
Port Configuraiton	Switch(config)# interface fa1 Switch(config-if)# spanning-tree bpdufilter a secure BPDU process on edge-port interfcae bpduguard a secure response to invalid configurations(received BPDU sent by self) cost change an interafce's spanning-tree port path cost edge-port interface attached to a LAN segment that is at the end of a bridged LAN or to an end node link-type the link type for the Rapid Spanning Tree mst the multiple spanning-tree port-priority the spanning tree port priority
Port Path Cost	Switch(config-if)# spanning-tree cost <1-200000000> 16-bit based value range from 1-65535, 32-bit based value range from 1-200,000,000 Switch(config-if)# spanning-tree cost 200000
Port Priority	Switch(config-if)# spanning-tree port-priority <0-240> Number from 0 to 240, in multiple of 16 Switch(config-if)# spanning-tree port-priority 128
Link Type - Auto	Switch(config-if)# spanning-tree link-type auto
Link Type - P2P	Switch(config-if)# spanning-tree link-type point-to-point
Link Type – Share	Switch(config-if)# spanning-tree link-type shared
Edge Port	Switch(config-if)# spanning-tree edge-port enable Switch(config-if)# spanning-tree edge-port disable
MSTP Port Configuration	Switch(config-if)# spanning-tree mst MSTMAP cost <1-200000000> the value of mst instance port cost Switch(config-if)# spanning-tree mst MSTMAP port-priority <0-240> the value of mst instance port priority in multiple of 16
Global Information	

Active Information	Switch# show spanning-tree active
	  Spanning-Tree : Enabled Protocol : MSTP
	  Root Address : 0012.77ee.eeee Priority : 32768
	  Root Path Cost : 0 Root Port : N/A
	  Root Times : max-age 20, hello-time 2, forward-delay 15
	  Bridge Address : 0012.77ee.eeee Priority : 32768
	  Bridge Times : max-age 20, hello-time 2, forward-delay 15
	  BPDU transmission-limit : 3
	
	   Port Role State Cost Prio.Nbr Type Aggregated

	------ ---------- ---------- -------- ---------- ------------ ------------ fa1 Designated Forwarding 200000 128.1 P2P(RSTP) N/A fa2 Designated Forwarding 200000 128.2 P2P(RSTP) N/A
RSTP Summary	Switch# show spanning-tree summary Switch is in rapid-stp mode. BPDU skewing detection disabled for the bridge. Backbonefast disabled for bridge. Summary of connected spanning tree ports : #Port-State Summary Blocking Listening Learning Forwarding Disabled -------- --------- -------- ---------- -------- 0 0 0 2 8 #Port Link-Type Summary AutoDetected PointToPoint SharedLink EdgePort ------------ ------------ ---------- -------- 9 0 1 9
Port Info	Switch# show spanning-tree port detail fa7 (Interface_ID) Rapid Spanning-Tree feature Enabled Port 128.6 as Disabled Role is in Disabled State Port Path Cost 200000, Port Identifier 128.6 RSTP Port Admin Link-Type is Auto, Oper Link-Type is Point-to-Point RSTP Port Admin Edge-Port is Enabled, Oper Edge-Port is Edge Designated root has priority 32768, address 0012.7700.0112 Designated bridge has priority 32768, address 0012.7760.1aec Designated Port ID is 128.6, Root Path Cost is 600000 Timers : message-age 0 sec, forward-delay 0 sec Link Aggregation Group: N/A, Type: N/A, Aggregated with: N/A BPDU: sent 43759 , received 4854 TCN : sent 0 , received 0 Forwarding-State Transmit count 12 Message-Age Expired count
MSTP Information	
MSTP Configuraiton	Switch# show spanning-tree mst configuration Current MST configuration (MSTP is Running) Name [korenix] Revision 65535 Instance Vlans Mapped -------- -------------------------------------- 0 1,4-4094 1 2 2 3 --- Config HMAC-MD5 Digest: 0xB41829F9030A054FB74EF7A8587FF58D ---
Display all MST Information	Switch# show spanning-tree mst ###### MST00 vlans mapped: 1,4-4094 Bridge address 0012.77ee.eeee priority 32768 (sysid 0) Root this switch for CST and IST Configured max-age 2, hello-time 15, forward-delay 20, max-hops 20 Port Role State Cost Prio.Nbr Type ------ ---------- ---------- -------- ---------- ------------------ fa1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) fa2 Designated Forwarding 200000 128.2 P2P Internal(MSTP)

	###### MST01 vlans mapped: 2 Bridge address 0012.77ee.eeee priority 32768 (sysid 1) Root this switch for MST01 Port Role State Cost Prio.Nbr Type ------ ---------- ---------- -------- ---------- ------------------ fa1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) fa2 Designated Forwarding 200000 128.2 P2P Internal(MSTP)
MSTP Root Information	Switch# show spanning-tree mst root MST Root Root Root Root Max Hello Fwd Instance Address Priority Cost Port age dly -------- -------------- -------- ----------- ------ ----- ----- ----- MST00 0012.77ee.eeee 32768 0 N/A 20 2 15 MST01 0012.77ee.eeee 32768 0 N/A 20 2 15 MST02 0012.77ee.eeee 32768 0 N/A 20 2 15
MSTP Instance Information	Switch# show spanning-tree mst 1 ###### MST01 vlans mapped: 2 Bridge address 0012.77ee.eeee priority 32768 (sysid 1) Root this switch for MST01 Port Role State Cost Prio.Nbr Type ------ ---------- ---------- -------- ---------- ------------------ fa1 Designated Forwarding 200000 128.1 P2P Internal(MSTP) fa2 Designated Forwarding 200000 128.2 P2P Internal(MSTP)
MSTP Port Information	Switch# show spanning-tree mst interface fa1 Interface fastethernet1 of MST00 is Designated Forwarding Edge Port : Edge (Edge) BPDU Filter : Disabled Link Type : Auto (Point-to-point) BPDU Guard : Disabled Boundary : Internal(MSTP) BPDUs : sent 6352, received 0 Instance Role State Cost Prio.Nbr Vlans mapped -------- ---------- ---------- -------- ---------- --------------------- 0 Designated Forwarding 200000 128.1 1,4-4094 1 Designated Forwarding 200000 128.1 2 2 Designated Forwarding 200000 128.1 3
Multiple Super Ring	
Create or configure a Ring	Switch(config)# multiple-super-ring 1 Ring 1 created Switch(config-multiple-super-ring)# ***Note: 1 is the target Ring ID which is going to be created or configured.***
Super Ring Version	Switch(config-multiple-super-ring)# version any-ring any ring auto detection default set default to rapid super ring rapid-super-ring rapid super ring super-ring super ring Switch(config-multiple-super-ring)# version rapid-super-ring
Priority	Switch(config-multiple-super-ring)# priority <0-255> valid range is 0 to 255 default set default Switch(config)# super-ring priority 100
Ring Port	Switch(config-multiple-super-ring)# port IFLIST Interface list, ex: fa1,fa3-5,gi8-10

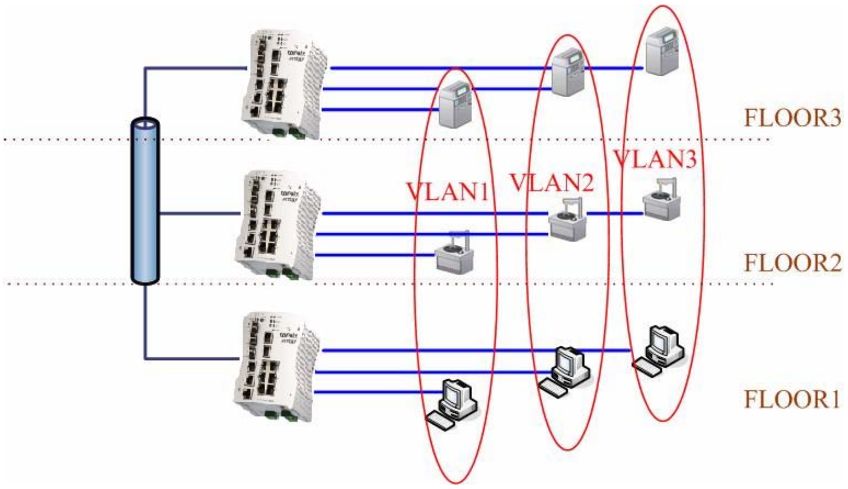
	cost path cost Switch(config-multiple-super-ring)# port fa1,fa2
Ring Port Cost	Switch(config-multiple-super-ring)# port cost <0-255> valid range is 0 or 255 default set default (128)valid range is 0 or 255 Switch(config-multiple-super-ring)# port cost 100 <0-255> valid range is 0 or 255 default set default (128)valid range is 0 or 255 Switch(config-super-ring-plus)# port cost 100 200 Set path cost success.
Rapid Dual Homing	Switch(config-multiple-super-ring)# rapid-dual-homing enable Switch(config-multiple-super-ring)# rapid-dual-homing disable Switch(config-multiple-super-ring)# rapid-dual-homing port IFLIST Interface name, ex: fastethernet1 or gi8 auto-detect up link auto detection IFNAME Interface name, ex: fastethernet1 or gi8 Switch(config-multiple-super-ring)# rapid-dual-homing port fa3,fa5-6 set Rapid Dual Homing port success. Note: auto-detect is recommended for dual Homing..
Ring Info	
Ring Info	Switch# show multiple-super-ring [Ring ID] [Ring1] Ring1 Current Status : Disabled Role : Disabled Ring Status : Abnormal Ring Manager : 0000.0000.0000 Blocking Port : N/A Giga Copper : N/A Configuration : Version : Rapid Super Ring Priority : 128 Ring Port : fa1, fa2 Path Cost : 100, 200 Dual-Homing II : Disabled Statistics : Watchdog sent 0, received 0, missed 0 Link Up sent 0, received 0 Link Down sent 0, received 0 Role Transition count 0 Ring State Transition count 1 Ring ID is optional. If the ring ID is typed, this command will only display the information of the target Ring.

4.5 VLAN

A Virtual LAN (VLAN) is a “logical” grouping of nodes for the purpose of limiting a broadcast domain to specific members of a group without physically grouping the members together. That means, VLAN allows you to isolate network traffic so that only members of VLAN could receive traffic from the same VLAN members. Basically, creating a VLAN from a switch is the logical equivalent of physically reconnecting a group of network devices to another Layer 2 switch, without actually disconnecting these devices from their original switches.

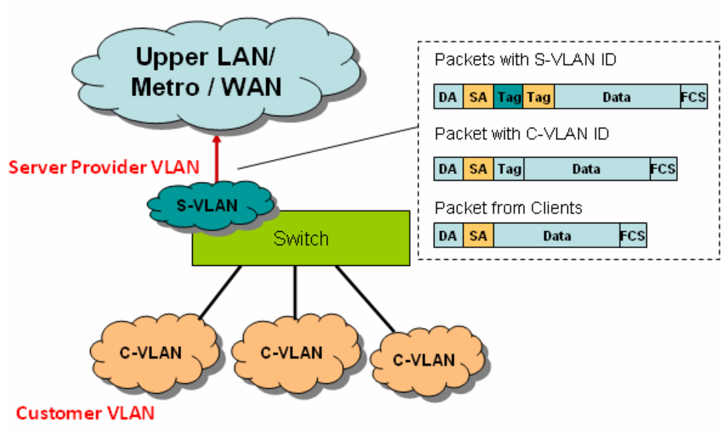
JetNet 5010G Series Industrial Ethernet Switch supports 802.1Q VLAN. 802.1Q VLAN is also known as Tag-Based VLAN. This Tag-Based VLAN allows VLAN to be created across different switches (see Figure 1). IEEE 802.1Q tag-based VLAN makes use of VLAN control information stored in a VLAN header attached to IEEE 802.3 packet frames. This tag contains a VLAN Identifier (VID) that indicates which VLAN a frame belongs to. Since each switch only has to check a frame’s tag, without the need to dissect the contents of the frame, this also saves a lot of computing resources within the switch.

Figure 4.5.1 802.1Q VLAN



QinQ

In JetNet 5010G firmware V2.4, Korenix release extended VLAN feature, QinQ. The QinQ is originally designed to expand the number of VLANs by adding a tag to the 802.1Q packets. The original VLAN is usually identified as Customer VLAN (C-VLAN) and the new added tag - as Service VLAN(S-VLAN). By adding the additional tag, QinQ increases the possible number of VLANs. After QinQ enabled, the JetNet 5010G can reach up to 256x256 VLANs. With different standard tags, it also improves the network security.



VLAN Configuration group enables you to Add/Remove VLAN, configure QinQ, port Ingress/Egress parameters and view VLAN table.

Following commands are included in this group:

4.5.1 VLAN Port Configuration

4.5.2 VLAN Configuration

4.5.3 GVRP Configuration

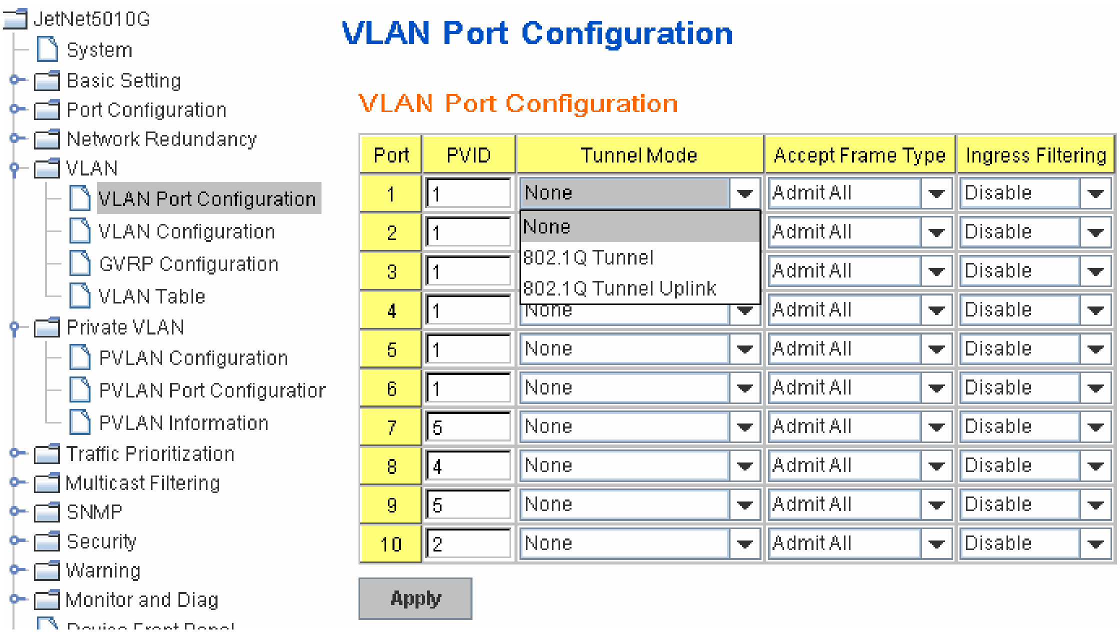
4.5.4 VLAN Table

4.5.5 CLI Commands of the VLAN

4.5.1 VLAN Port Configuration

VLAN Port Configuration allows you to set up VLAN port parameters to specific port. These parameters include PVID, Accept Frame Type and Ingress Filtering.

Figure 4.5.2 Web UI of VLAN Port configuration.



VLAN Port Configuration

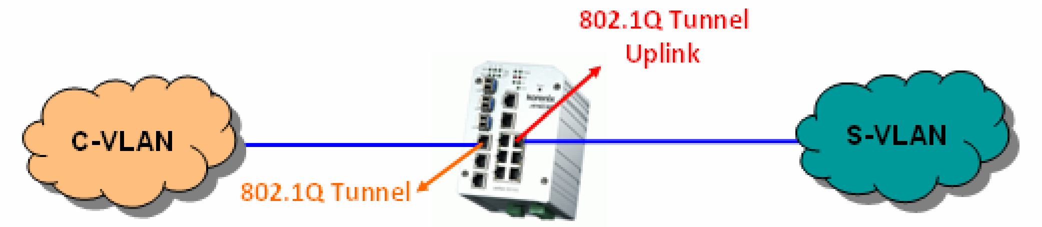
VLAN Port Configuration

Port	PVID	Tunnel Mode	Accept Frame Type	Ingress Filtering
1	1	None	Admit All	Disable
2	1		Admit All	Disable
3	1		Admit All	Disable
4	1	None	Admit All	Disable
5	1	None	Admit All	Disable
6	1	None	Admit All	Disable
7	5	None	Admit All	Disable
8	4	None	Admit All	Disable
9	5	None	Admit All	Disable
10	2	None	Admit All	Disable

PVID: The abbreviation of the **Port VLAN ID**. Enter port VLAN ID here. PVID allows the switches to identify which port belongs to which VLAN. To keep things simple, it is recommended that PVID is equivalent to VLAN IDs.

The values of PVIDs are from 0 to 4095. But, 0 and 4095 are reserved. You can’t input these 2 PVIDs. 1 is the default value. 2 to 4094 are valid and available in this column. Type the PVID you’d like to configure here.

Tunnel Mode: This is the new command for QinQ. The command includes None, 802.1Q Tunnel and 802.1Q Tunnel Uplink. The figure shows the relationship between 802.1Q Tunnel and 802.1Q Tunnel Uplink.



Following is the modes you can select.

None: Remian VLAN setting, no QinQ.

802.1Q Tunnel: The QinQ command applied to the ports which connect to the C-VLAN. The port receives tagged frame from the C-VLAN. Add a new tag (Port VID) as S-VLAN VID. When the packets are forwarded to C-VLAN, the S-VLAN tag is removed.

After 802.1Q Tunnel mode is assigned to a port, the egress setting of the port should be "**Untag**", it indicates the egress packet is always untagged. This is configured in Static VLAN Configuration table. Please refer to the VLAN Configuration chapter in below.

802.1Q Tunnel Uplink: The QinQ command applied to the ports which connect to the S-VLAN. The port receives tagged frame from the S-VLAN. When the packets are forwarded to S-VLAN, the S-VLAN tag is kept.

After 802.1Q Tunnel Uplink mode is assigned to a port, the egress setting of the port should be "**Tag**", it indicates the egress packet is always tagged. This is configured in Static VLAN Configuration table. Please refer to the VLAN Configuration chapter in below.

For example, the VID of S-VLAN/Tunnel Uplink is 10, the VID of C-VLAN/Tunnel is 5. The 802.1Q Tunnel port receives tag 5 from C-VLAN, add tag 10 to the packet. When the packets are forwarded to S-VLAN, tag 10 is kept.

Accept Frame Type: This column defines the accepted frame type of the port. There are 2 modes you can select, **Admit All** and **Tag Only**. Admit All mode means that the port can accept both tagged and untagged packets. Tag Only mode means that the port can only accept tagged packets.

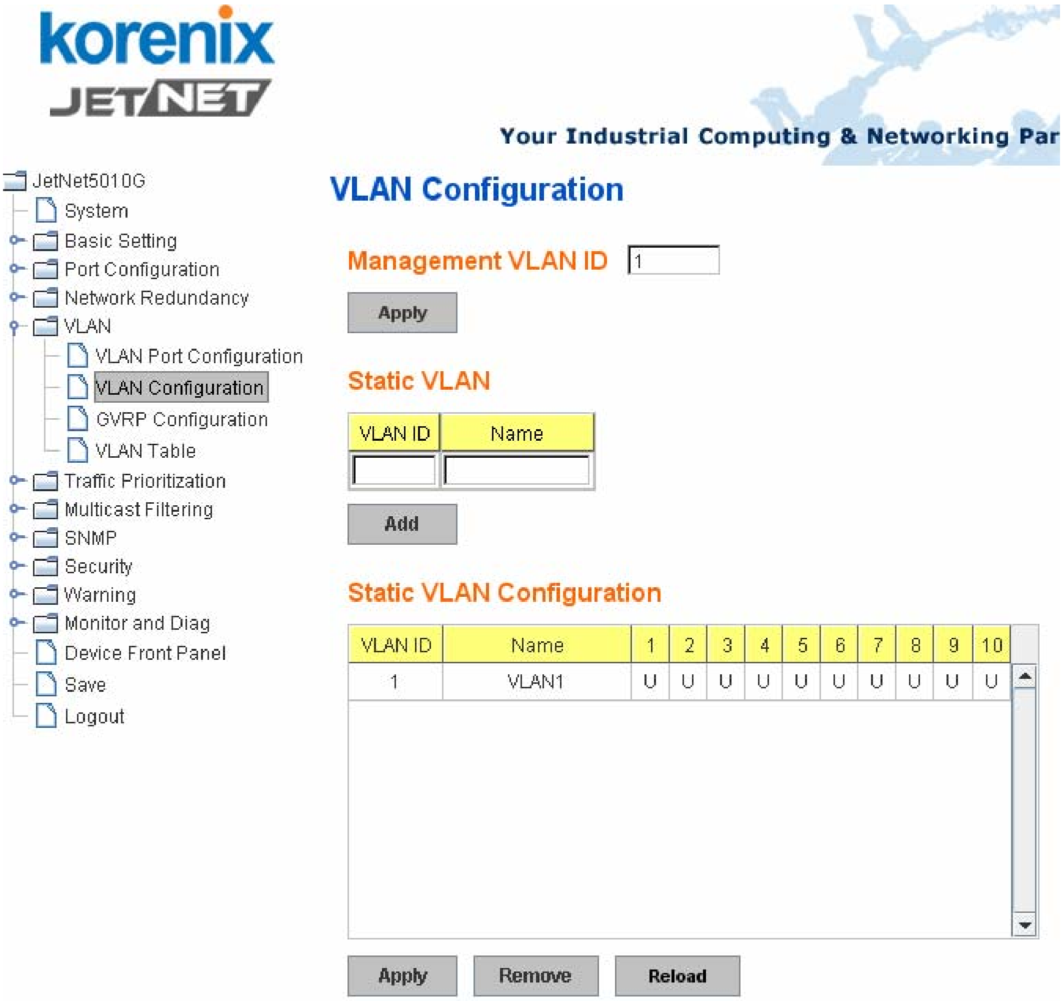
Ingress Filtering: Ingress filtering helps VLAN engine to filter out undesired traffic on a port. When Ingress Filtering is enabled, the port checks whether the incoming frames belong to the VLAN they claimed or not. Then the port determines if the frames can be processed or not. For example, if a tagged frame from Engineer VLAN is received, and Ingress Filtering is enabled, the switch will determine if the port is on the Engineer VLAN's Egress list. If it is, the frame can be processed. If it's not, the frame would be dropped.

After 802.1Q Tunnel or 802.1Q Tunnel Uplink is enabled, the Ingress Filtering can not be configured.

4.5.2 VLAN Configuration

In this page, you can assign Management VLAN, create the static VLAN, and assign the Egress rule for the member ports of the VLAN.

Figure 4.5.2.1 Web UI of the VLAN Configuration.



VLAN Configuration

Management VLAN ID: 1

Static VLAN

VLAN ID	Name

Static VLAN Configuration

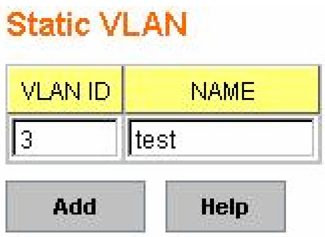
VLAN ID	Name	1	2	3	4	5	6	7	8	9	10
1	VLAN1	U	U	U	U	U	U	U	U	U	U

Management VLAN ID: The switch supports management VLAN. The management VLAN ID is the VLAN ID of the CPU interface so that only member ports of the management VLAN can ping and access the switch. The default management VLAN ID is “**1**”.

Static VLAN: You can assign a VLAN ID and VLAN Name for new VLAN here.

VLAN ID is used by the switch to identify different VLANs. Valid VLAN ID is between 1 and 4094. 1 is the default VLAN.

VLAN Name is a reference for network administrator to identify different VLANs. The available character is 12 for you to input. If you don’t input VLAN name, the system will automatically assign VLAN name for the VLAN. The rule is VLAN (VLAN ID).



Static VLAN

VLAN ID	NAME
3	test

Figure 4.5.2.2 The steps to create a new VLAN: Type VLAN ID and NAME, and press **Add** to create a new VLAN. Then you can see the new VLAN in the Static VLAN Configuration table. Refer to Figure 4.5.2.3

After created the VLAN, the status of the VLAN will remain in Unused until you add ports to the VLAN.

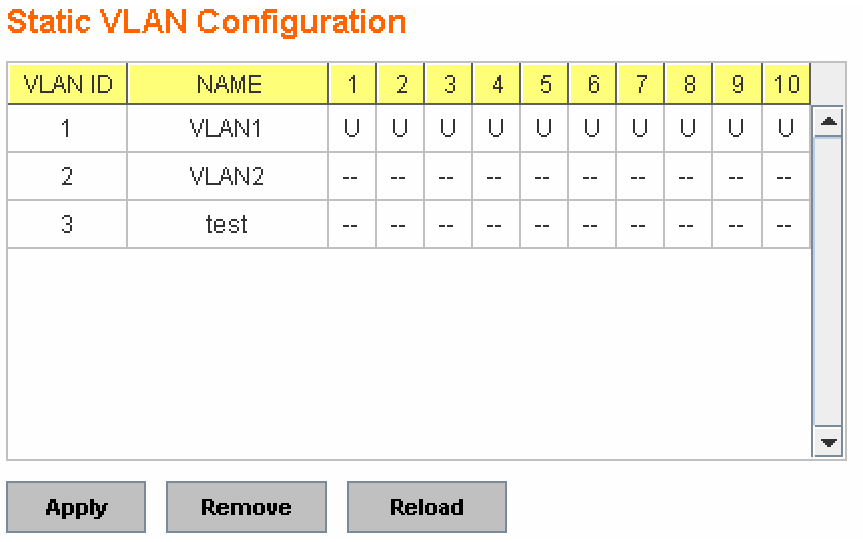
Note: *Before you change the management VLAN ID by Web and Telnet, remember that the port attached by the administrator should be the member port of the management VLAN; otherwise the administrator can’t access the switch via the network.*

Note: *Currently JetNet 5010G only support max 64 group VLAN.*

Static VLAN Configuration

You can see the created VLANs and specify the egress (outgoing) port rule to be **Untagged or Tagged** here.

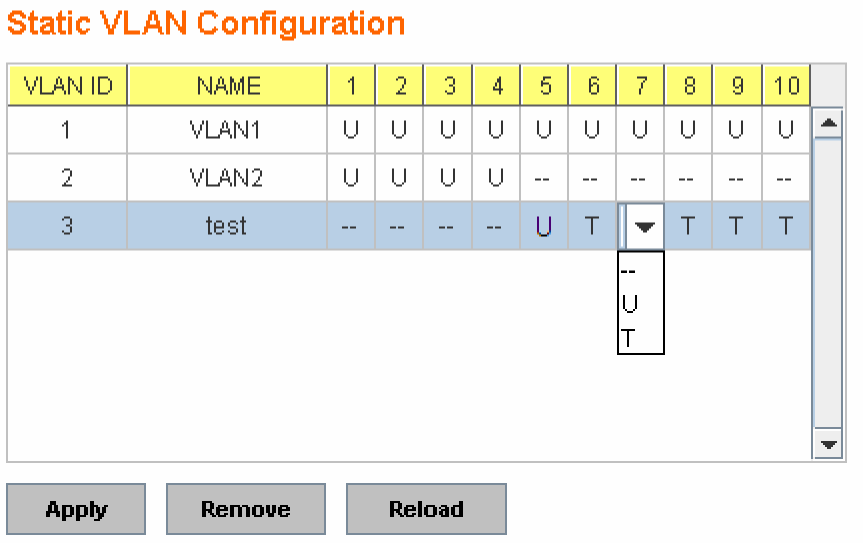
Figure 4.5.2.3 Static VLAN Configuration table. You can see that new VLAN 3 is created. VLAN name is test. Egress rules of the ports are not configured now.



Static VLAN Configuration

VLAN ID	NAME	1	2	3	4	5	6	7	8	9	10
1	VLAN1	U	U	U	U	U	U	U	U	U	U
2	VLAN2	--	--	--	--	--	--	--	--	--	--
3	test	--	--	--	--	--	--	--	--	--	--

Figure 4.5.2.4 Configure Egress rule of the ports.



Static VLAN Configuration

VLAN ID	NAME	1	2	3	4	5	6	7	8	9	10
1	VLAN1	U	U	U	U	U	U	U	U	U	U
2	VLAN2	U	U	U	U	--	--	--	--	--	--
3	test	--	--	--	--	U	T		T	T	T

-- : Not available

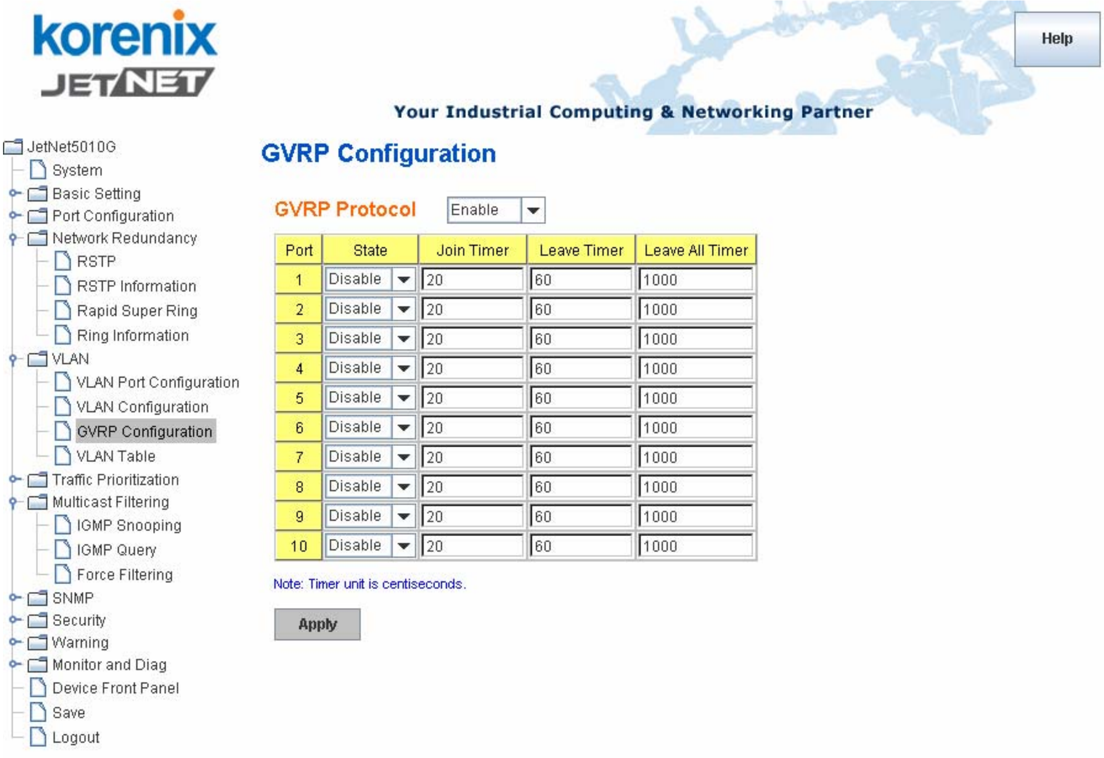
U: **Untag**: Indicates that egress/outgoing frames are not VLAN tagged.

T : **Tag**: Indicates that egress/outgoing frames are to be VLAN tagged.

Steps to configure Egress rules: Select the VLAN ID. Entry of the selected VLAN turns to light blue. Assign Egress rule of the ports to **U** or **T**. Press **Apply** to apply the setting. If you want to remove one VLAN, select the VLAN entry. Then press **Remove** button.

4.5.3 GVRP configuration

GVRP allows users to set-up VLANs automatically rather than manual configuration on every port of every switch in the network.



GVRP Configuration

GVRP Protocol: Enable

Port	State	Join Timer	Leave Timer	Leave All Timer
1	Disable	20	60	1000
2	Disable	20	60	1000
3	Disable	20	60	1000
4	Disable	20	60	1000
5	Disable	20	60	1000
6	Disable	20	60	1000
7	Disable	20	60	1000
8	Disable	20	60	1000
9	Disable	20	60	1000
10	Disable	20	60	1000

Note: Timer unit is centiseconds.

GVRP Protocol: Allow user to enable/disable GVRP globally.

State: After enable GVRP globally, here still can enable/disable GVRP by port.

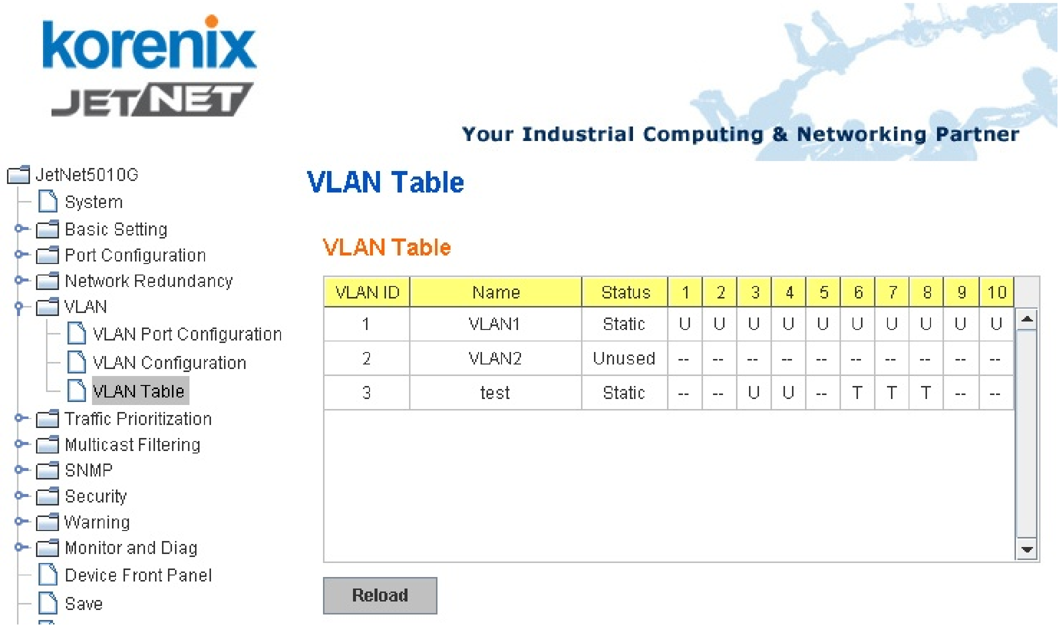
Join Timer: Controls the interval of sending the GVRP Join BPDU. An instance of this timer is required on a per-Port, per-GARP Participant basis

Leave Timer: Control the time to release the GVRP reservation after received the GVRP Leave BPDU. An instance of the timer is required for each state machine that is in the LV state

Leave All Timer: Controls the period to initiate the garbage collection of registered VLAN. The timer is required on a per-Port, per-GARP Participant basis

4.5.4 VLAN Table

This table shows you current settings of your VLAN table, including VLAN ID, Name, Status, and Egress rule of the ports.



VLAN Table

VLAN Table

VLAN ID	Name	Status	1	2	3	4	5	6	7	8	9	10
1	VLAN1	Static	U	U	U	U	U	U	U	U	U	U
2	VLAN2	Unused	--	--	--	--	--	--	--	--	--	--
3	test	Static	--	--	U	U	--	T	T	T	--	--

VLAN ID: ID of the VLAN.

Name: Name of the VLAN.

Status: Static shows this is a manually configured static VLAN. **Unused** means this VLAN is created by UI/CLI and has no member ports. This VLAN is not workable yet. **Dynamic** means this VLAN is learnt by GVRP.

After created the VLAN, the status of this VLAN will remain in Unused status until you add ports to the VLAN.

4.5.5 CLI Commands of the VLAN

Command Lines of the VLAN port configuration, VLAN configuration and VLAN table display

Feature	Command Line
VLAN Port Configuration (Go to the port interface configuration mode first.)	
Port Interface Configuraion	Switch# conf ter Switch(config)# interface fa5 Switch(config-if)#
VLAN Port PVID	Switch(config-if)# switchport trunk native vlan 2 Set port default vlan id to 2 success
QinQ Tunnel Mode 802.1Q Tunnel = access 802.1Q Tunnel Uplink = uplink	Switch(config-if)# switchport dot1q-tunnel mode Set the interface as an IEEE 802.1Q tunnel mode Switch(config-if)# switchport dot1q-tunnel mode access Set the interface as an access port of IEEE 802.1Q tunnel mode uplink Set the interface as an uplink port of IEEE 802.1Q tunnel mode
Port Accept Frame Type	Switch(config-if)# acceptable frame type all any kind of frame type is accepted!

	Switch(config-if)# acceptable frame type vlantaggedonly only vlan-tag frame is accepted!
Ingress Filtering (for fast Ethernet port 1)	Switch(config-if)# ingress filtering enable ingress filtering enable Switch(config-if)# ingress filtering disable ingress filtering disable
Egress rule – Untagged (for VLAN 2)	Switch(config-if)# switchport access vlan 2 switchport access vlan - success
Egress rule – Tagged (for VLAN 2)	Switch(config-if)# switchport trunk allowed vlan add 2
Display – Port Ingress Rule (PVID, Ingress Filtering, Acceptable Frame Type)	Switch# show interface fa1 Interface fastethernet1 Administrative Status : Enable Operating Status : Not Connected Duplex : Auto Speed : Auto Flow Control :off Default Port VLAN ID: 2 Ingress Filtering : Disabled Acceptable Frame Type : All Port Security : Disabled Auto Negotiation : Enable Loopback Mode : None STP Status: disabled Default CoS Value for untagged packets is 0. Mdix mode is Auto. Medium mode is Copper.
Display – Port Egress Rule (Egress rule, IP address, status)	Switch# show running-config …… ! interface fastethernet1 switchport access vlan 1 switchport access vlan 3 switchport trunk native vlan 2 ……. interface vlan1 ip address 192.168.10.8/24 no shutdown
QinQ Information – 802.1Q Tunnel	Switch# show dot1q-tunnel dot1q-tunnel mode port 1 : normal port 2 : normal port 3 : normal port 4 : normal port 5 : access port 6 : uplink port 7 : normal port 8 : normal port 9 : normal port 10 : normal
QinQ Information – Show Running	Switch# show running-config Building configuration... Current configuration: hostname Switch

	vlan learning independent ……… ……… interface fastethernet5 switchport access vlan add 1-2,10 switchport dot1q-tunnel mode access ! interface fastethernet6 switchport access vlan add 1-2 switchport trunk allowed vlan add 10 switchport dot1q-tunnel mode uplink !
VLAN Configuration	
Create VLAN (2)	Switch(config)# vlan 2 vlan 2 success Switch(config)# interface vlan 2 Switch(config-if)# *Note: In CLI configuration, you should create a VLAN interface first. Then you can start to add/remove ports. Default status of the created VLAN is unused until you add member ports to it.*
Remove VLAN	Switch(config)# no vlan 2 no vlan success *Note: You can only remove the VLAN when the VLAN is in unused mode.*
VLAN Name	Switch(config)# vlan 2 vlan 2 has exists Switch(config-vlan)# name v2 Switch(config-vlan)# no name *Note: Use no name to change the name to default name, VLAN VID.*
VLAN description	Switch(config)# interface vlan 2 Switch(config-if)# Switch(config-if)# description this is the VLAN 2 Switch(config-if)# no description ->Delete the description.
IP address of the VLAN	Switch(config)# interface vlan 2 Switch(config-if)# Switch(config-if)# ip address 192.168.10.18/24 Switch(config-if)# no ip address 192.168.10.8/24 ->Delete the IP address
Create multiple VLANs (VLAN 5-10)	Switch(config)# interface vlan 5-10
Shut down VLAN	Switch(config)# interface vlan 2 Switch(config-if)# shutdown Switch(config-if)# no shutdown ->Turn on the VLAN
Display – VLAN table	Switch# sh vlan VLAN Name Status Trunk Ports Access Ports ---- ------------ ------- -------------------------- --------------------------

	1 VLAN1 Static - fa1-7,gi8-10 2 VLAN2 Unused - - 3 test Static fa4-7,gi8-10 fa1-3,fa7,gi8-10
Display – VLAN interface information	Switch# show interface vlan1 interface vlan1 is up, line protocol detection is disabled index 14 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST> HWaddr: 00:12:77:ff:01:b0 inet 192.168.10.100/24 broadcast 192.168.10.255 input packets 639, bytes 38248, dropped 0, multicast packets 0 input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0 output packets 959, bytes 829280, dropped 0 output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0 collisions 0
GVRP configuration	
GVRP enable/disable	Switch(config)# gvrp mode disable Disable GVRP feature globally on the switch enable Enable GVRP feature globally on the switch Switch(config)# gvrp mode enable Gvrp is enabled on the switch!
Configure GVRP timer Join timer /Leave timer/ LeaveAll timer	Switch(config)# inter fa1 Switch(config-if)# garp timer <10-10000> Switch(config-if)# garp timer 20 60 1000 Note: The unit of these timer is centisecond
Management VLAN	
Management VLAN	Switch(config)# int vlan 1 (Go to management VLAN) Switch(config-if)# no shutdown
Display	Switch# show running-config …. ! interface vlan1 ip address 192.168.10.17/24 ip igmp no shutdown ! ….

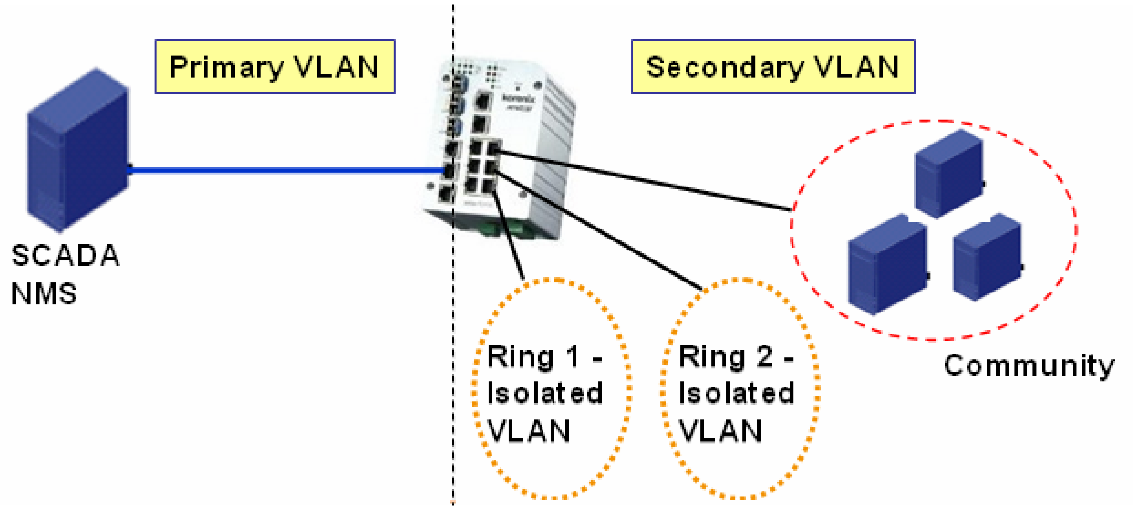
4.6 Private VLAN

The private VLAN helps to resolve the primary VLAN ID shortage, client ports' isolation and network security issues. The Private VLAN provides primary and secondary VLAN within a single switch.

Primary VLAN: The uplink port is usually the primary VLAN. A primary VLAN contains promiscuous ports that can communicate with lower Secondary VLANs.

Secondary VLAN: The client ports are usually defined within secondary VLAN. The secondary VLAN includes Isolated VLAN and Community VLAN. The client ports can be isolated VLANs or can be grouped in the same Community VLAN. The ports within the same community VLAN can communicate with each other. However, the isolated VLAN ports can Not.

The figure shows the typical Private VLAN network. The SCADA/Public Server or NMS workstation is usually located in primary VLAN. The clients PCs or Rings are located within Secondary.



Private VLAN (PVLAN) Configuration group enables you to Configure PVLAN, PVLAN Port and see the PVLAN Information.

Following commands are included in this group:

4.6.1 PVLAN Configuration

4.6.2 PVLAN Port Configuration

4.6.3 CLI Commands of the PVLAN

4.6.1 PVLAN Configuration

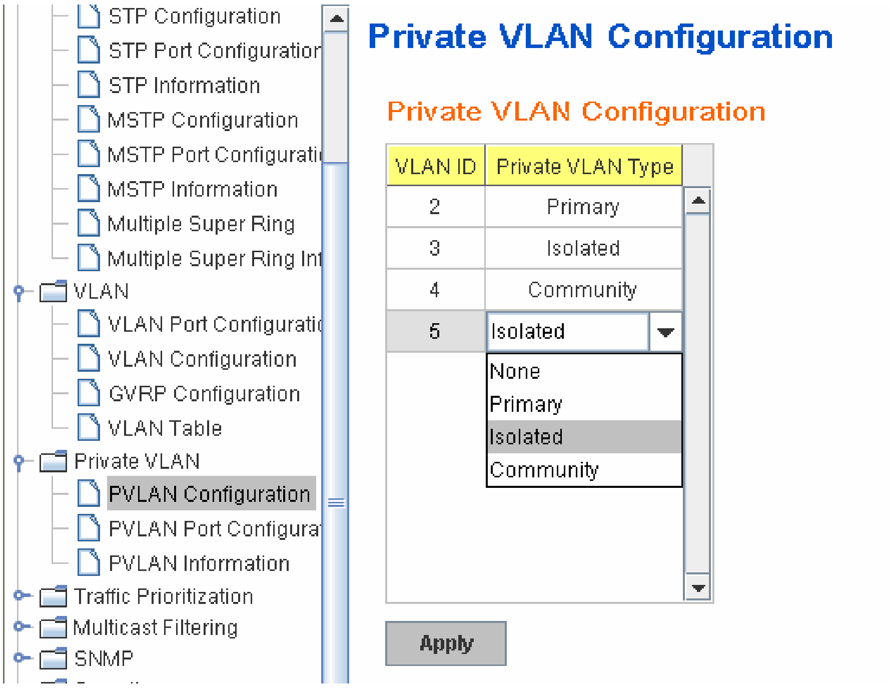
PVLAN Configuration allows you to assign Private VLAN type. After created VLAN in VLAN Configuraiton page, the available VLAN ID will display here. Choose the Private VLAN types for each VLAN you want configure.

None: The VLAN is Not included in Private VLAN.

Primary: The VLAN is the Primary VLAN. The member ports can communicate with secondary ports.

Isolated: The VLAN is the Isolated VLAN. The member ports of the VLAN are isolated.

Community: The VLAN is the Community VLAN. The member ports of the VLAN can communicate with each other.



Private VLAN Configuration

Private VLAN Configuration

VLAN ID	Private VLAN Type
2	Primary
3	Isolated
4	Community
5	Isolated

4.6.2 PVLAN Port Configuration

PVLAN Port Configuration page allows configure Port Configuration and Private VLAN Association.

Private VLAN Association

Secondary VLAN: After the Isolated and Community VLAN Type is assigned in Private VLAN Configuration page, the VLANs are belonged to the Secondary VLAN and displayed here.

Primary VLAN: After the Primary VLAN Type is assigned in Private VLAN Configuration page, the secondary VLAN can associate to the Primary VLAN ID. Select the Primary VLAN ID here.

Note: Before configuring PVLAN port type, the Private VLAN Association should be done first.

Port Configuraion

PVLAN Port Type :

Normal: The Normal port is None PVLAN ports, it remains its original VLAN setting.

Host: The Host type ports can be mapped to the Secondary VLAN.

Promiscuous: The promiscuous port can be associated to the Primary VLAN.

VLAN ID: After assigned the port type, the web UI display the available VLAN ID the port can associate to.

For example:

1. VLAN Create: VLAN 2-5 are created in VLAN Configuration page.

2. Private VLAN Type: VLAN 2-5 has its Private VLAN Type configured in Private VLAN Configuration page.

VLAN 2 is belonged to Primary VLAN.

VLAN 3-5 are belonged to secondary VLAN (Isolated or Community).

3. Private VLAN Association: Associate VLAN 3-5 to VLAN 2 in Private VLAN Association first.

4. Private VLAN Port Configuraiton

VLAN 2 – Primary -> The member port of VLAN 2 is promiscuous port.

VLAN 3 – Isolated -> The Host port can be mapped to VLAN 3.

VLAN 4 – Community -> The Host port can be mapped to VLAN 3.

VLAN 5 – Community -> The Host port can be mapped to VLAN 3.

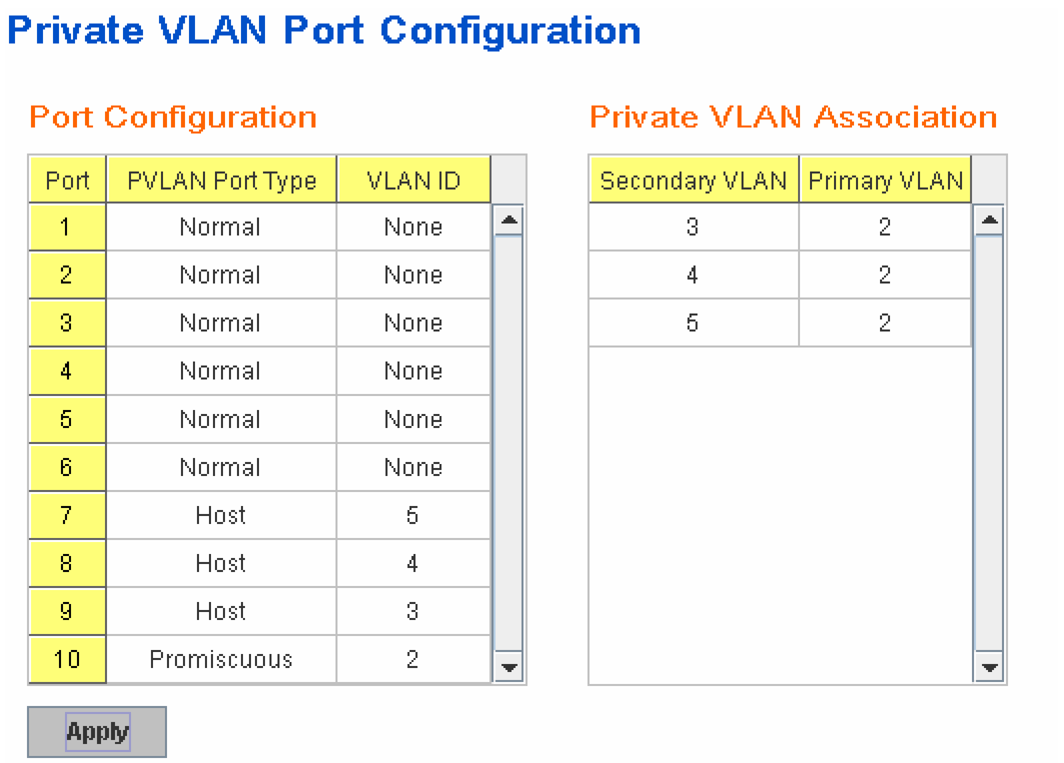
5. Result:

VLAN 2 -> VLAN 3, 4, 5; member ports can communicate with ports in secondary VLAN.

VLAN 3 -> VLAN 2, member ports are isolated, but it can communicate with member port of VLAN 2..

VLAN 4 -> VLAN 2, member ports within the community can communicate with each other and communicate with member port of VLAN 2.

VLAN 5 -> VLAN 2, member ports within the community can communicate with each other and communicate with member port of VLAN 2.



Private VLAN Port Configuration

Port Configuration

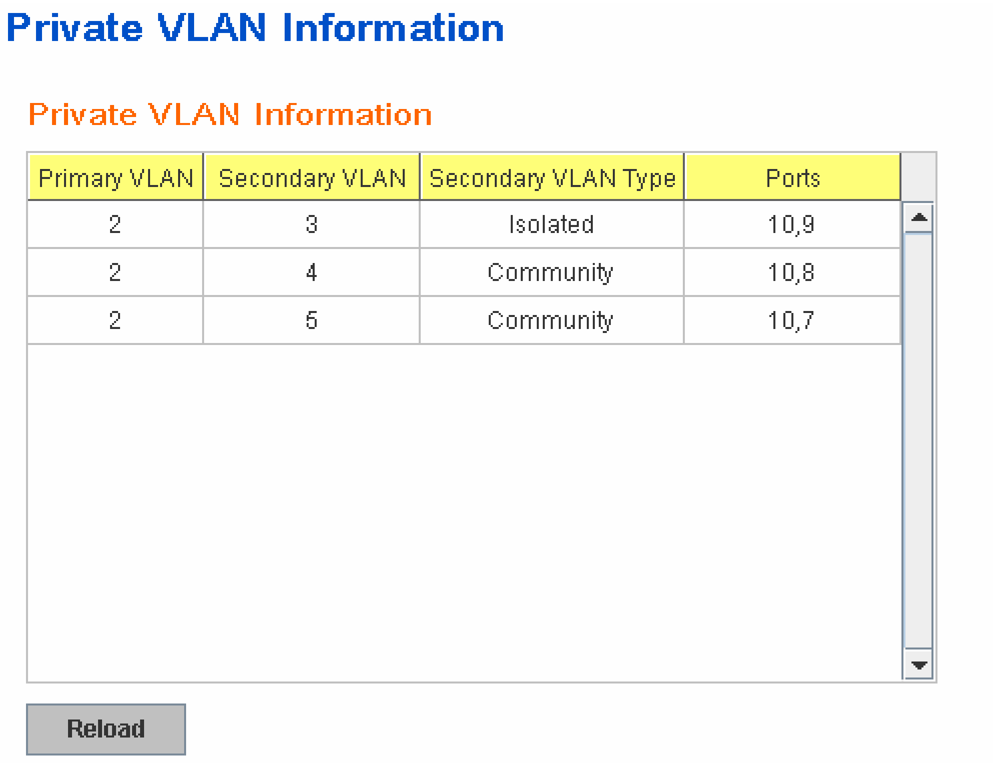
Port	PVLAN Port Type	VLAN ID
1	Normal	None
2	Normal	None
3	Normal	None
4	Normal	None
5	Normal	None
6	Normal	None
7	Host	5
8	Host	4
9	Host	3
10	Promiscuous	2

Private VLAN Association

Secondary VLAN	Primary VLAN
3	2
4	2
5	2

4.6.3 Private VLAN Information

This page allows you to see the Private VLAN information.



Private VLAN Information

Private VLAN Information

Primary VLAN	Secondary VLAN	Secondary VLAN Type	Ports
2	3	Isolated	10,9
2	4	Community	10,8
2	5	Community	10,7

4.6.4 CLI Command of the PVLAN

Command Lines of the Private VLAN configuration

Feature	Command Line
Private VLAN Configuration	
Create VLAN	Switch(config)# vlan 2 vlan 2 success Switch(config-vlan)# end End current mode and change to enable mode exit Exit current mode and down to previous mode list Print command list name Assign a name to vlan no no private-vlan Configure a private VLAN
Private VLAN Type Choose the Types	**Go to the VLAN you want configure first.** Switch(config)# vlan (VID) Switch(config-vlan)# private-vlan community Configure the VLAN as an community private VLAN isolated Configure the VLAN as an isolated private VLAN primary Configure the VLAN as a primary private VLAN

Primary Type	Switch(config-vlan)# private-vlan primary <cr>
Isolated Type	Switch(config-vlan)# private-vlan isolated <cr>
Community Type	Switch(config-vlan)# private-vlan community <cr>
Private VLAN Port Configuraiton	

Go to the port configuraiton	Switch(config)# interface (port_number, ex: gi9)
	Switch(config-if)# switchport private-vlan
	   host-association Set the private VLAN host association
	   mapping map primary VLAN to secondary VLAN

Private VLAN Port Type	Switch(config-if)# switchport mode private-vlan Set private-vlan mode Switch(config-if)# switchport mode private-vlan host Set the mode to private-vlan host promiscuous Set the mode to private-vlan promiscuous
Promiscuous Port Type	Switch(config-if)# switchport mode private-vlan promiscuous <cr>
Host Port Type	Switch(config-if)# switchport mode private-vlan host <cr>
Private VLAN Port Configuration	Switch(config)# interface gi9
PVLAN Port Type	Switch(config-if)# switchport mode private-vlan host
Host Association primary to secondary (The command is only available for host port.)	Switch(config-if)# switchport private-vlan host-association <2-4094> Primary range VLAN ID of the private VLAN port association Switch(config-if)# switchport private-vlan host-association 2 <2-4094> Secondary range VLAN ID of the private VLAN port association Switch(config-if)# switchport private-vlan host-association 2 3
Mapping primary to secondary VLANs (This command is only available for promiscuous port)	Switch(config)# interface gi10 Switch(config-if)# switchport mode private-vlan promiscuous Switch(config-if)# switchport private-vlan mapping 2 add 3 Switch(config-if)# switchport private-vlan mapping 2 add 4 Switch(config-if)# switchport private-vlan mapping 2 add 5
Private VLAN Information	
Private VLAN Information	Switch# show vlan private-vlan FLAGS: I -> Isolated P -> Promiscuous C -> Community Primary Secondary Type Ports ------- --------- ---------------- -------------------- 2 3 Isolated gi10(P),gi9(I) 2 4 Community gi10(P),gi8(C) 2 5 Community gi10(P),fa7(C),gi9(I) 10 - - -
PVLAN Type	Switch# show vlan private-vlan type

	Vlan Type Ports ---- ----------------- ----------------- 2 primary gi10 3 isolated gi9 4 community gi8 5 community fa7,gi9 10 primary -
Host List	Switch# show vlan private-vlan port-list Ports Mode Vlan ----- ----------- ---- 1 normal - 2 normal - 3 normal - 4 normal - 5 normal - 6 normal - 7 host 5 8 host 4 9 host 3 10 promiscuous 2
Running Config Information	Switch# show run Building configuration... Current configuration: hostname Switch vlan learning independent ! vlan 1 !
Private VLAN Type	vlan 2 private-vlan primary ! vlan 3 private-vlan isolated ! vlan 4 private-vlan community ! vlan 5 private-vlan community ! ……….. ………..
Private VLAN Port Information	interface fastethernet7 switchport access vlan add 2,5 switchport trunk native vlan 5 switchport mode private-vlan host switchport private-vlan host-association 2 5 ! interface gigabitethernet8 switchport access vlan add 2,4 switchport trunk native vlan 4 switchport mode private-vlan host switchport private-vlan host-association 2 4 ! interface gigabitethernet9 switchport access vlan add 2,5

	switchport trunk native vlan 5 switchport mode private-vlan host switchport private-vlan host-association 2 3 ! interface gigabitethernet10 switchport access vlan add 2,5 switchport trunk native vlan 2 switchport mode private-vlan promiscuous switchport private-vlan mapping 2 add 3-5 ……… ……..

4.7 Traffic Prioritization

Quality of Service (QoS) provides traffic prioritization mechanism which allows users to deliver better service to certain flows. QoS can also help to alleviate congestion problems and ensure high-priority traffic is delivered first. This section allows you to configure Traffic Prioritization settings for each port with regard to setting priorities.

JetNet QOS supports 4 physical queues, weighted fair queuing (WRR) and Strict Priority scheme, which follows 802.1p COS tag and IPv4 TOS/DiffServ information to prioritize the traffic of your industrial network.

Following commands are included in this group:

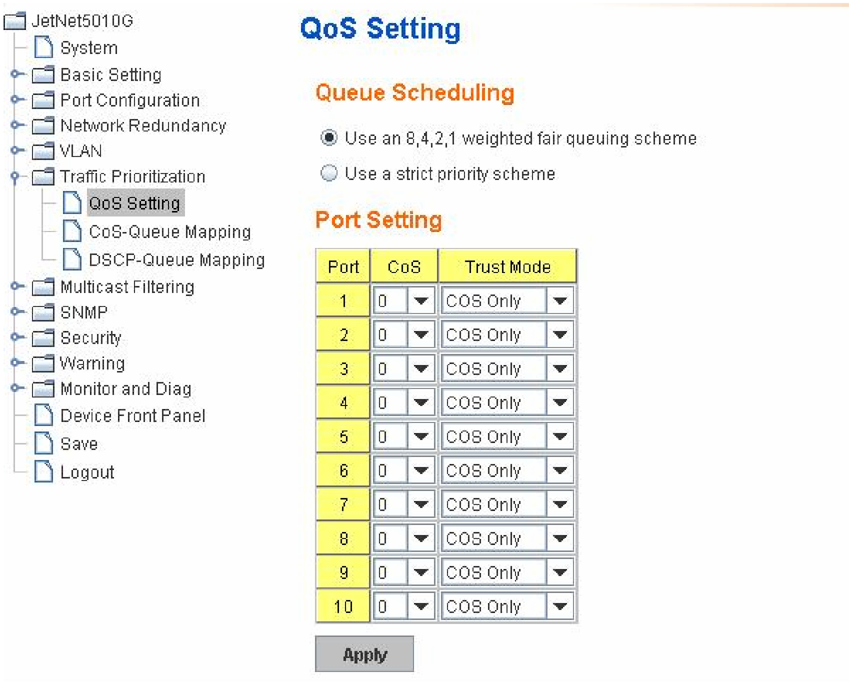
4.6.1 QoS Setting

4.6.2 CoS-Queue Mapping

4.6.3 DSCP-Queue Mapping

4.6.4 CLI Commands of the Traffic Prioritization

4.7.1 QoS Setting



QoS Setting

Queue Scheduling

● Use an 8,4,2,1 weighted fair queuing scheme

○ Use a strict priority scheme

Port Setting

Port	CoS	Trust Mode
1	0	COS Only
2	0	COS Only
3	0	COS Only
4	0	COS Only
5	0	COS Only
6	0	COS Only
7	0	COS Only
8	0	COS Only
9	0	COS Only
10	0	COS Only

Queue Scheduling

You can select the Queue Scheduling rule as follows:

Use an 8,4,2,1 weighted fair queuing scheme. This is also known as **WRR** (Weight Round Robin)**.** JetNet will follow 8:4:2:1 rate to process the packets in a queue from the highest priority to the lowest. For example, the system will process 8 packets with the highest priority in the queue, 4 with middle priority, 2 with low priority, and 1 with the lowest priority at the same time.

Use a strict priority scheme. Packets with higher priority in the queue will always be processed first, except that there is no packet with higher priority.

Port Setting

CoS column is to indicate default port priority value for untagged or priority-tagged frames. When JetNet receives the frames, JetNet will attach the value to the CoS field of the incoming VLAN-tagged packets. You can enable 0,1,2,3,4,5,6 or 7 to the port.

Trust Mode is to indicate Queue Mapping types for you to select.

COS Only: Port priority will only follow COS-Queue Mapping you have assigned.

DSCP Only: Port priority will only follow DSCP-Queue Mapping you have assigned.

COS first: Port priority will follow COS-Queue Mapping first, and then DSCP-Queue Mapping rule.

DSCP first: Port priority will follow DSCP-Queue Mapping first, and then COS-Queue Mapping rule.

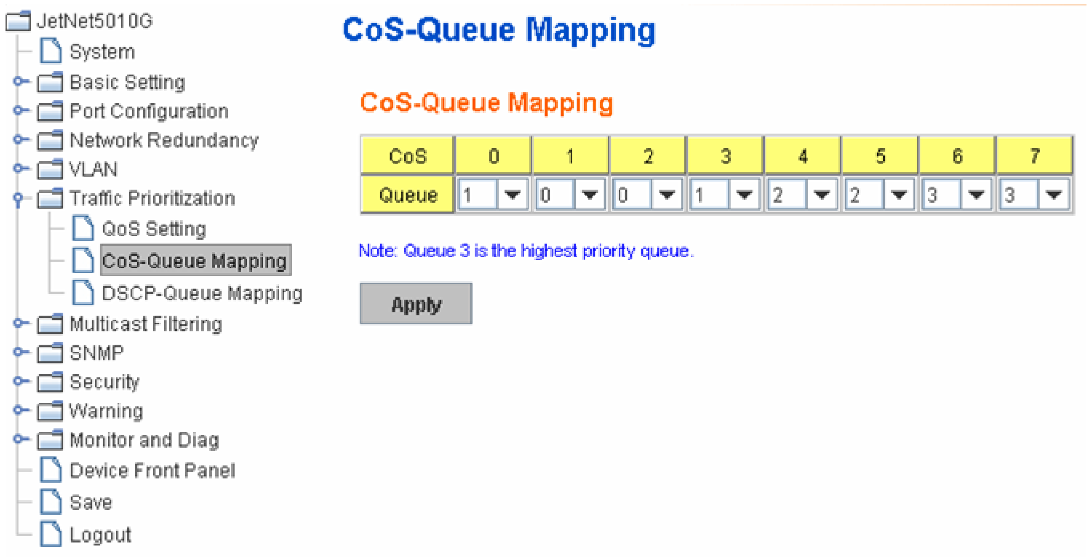
Default priority type is **COS Only**. The system will provide default COS-Queue table to which you can refer for the next command.

After configuration, press **Apply** to enable the settings.

4.7.2 CoS-Queue Mapping

This page is to change CoS values to Physical Queue mapping table. Since the switch fabric of JetNet only supports 4 physical queues, Lowest, Low, Middle and High. Users should therefore assign how to map CoS value to the level of the physical queue.

In JetNet, users can freely assign the mapping table or follow the suggestion of the 802.1p standard. Korenix uses 802.p suggestion as default values. You can find CoS values 1 and 2 are mapped to physical Queue 0, the lowest queue. CoS values 0 and 3 are mapped to physical Queue 1, the low/normal physical queue. CoS values 4 and 5 are mapped to physical Queue 2, the middle physical queue. CoS values 6 and 7 are mapped to physical Queue 3, the high physical queue.



CoS-Queue Mapping

CoS-Queue Mapping

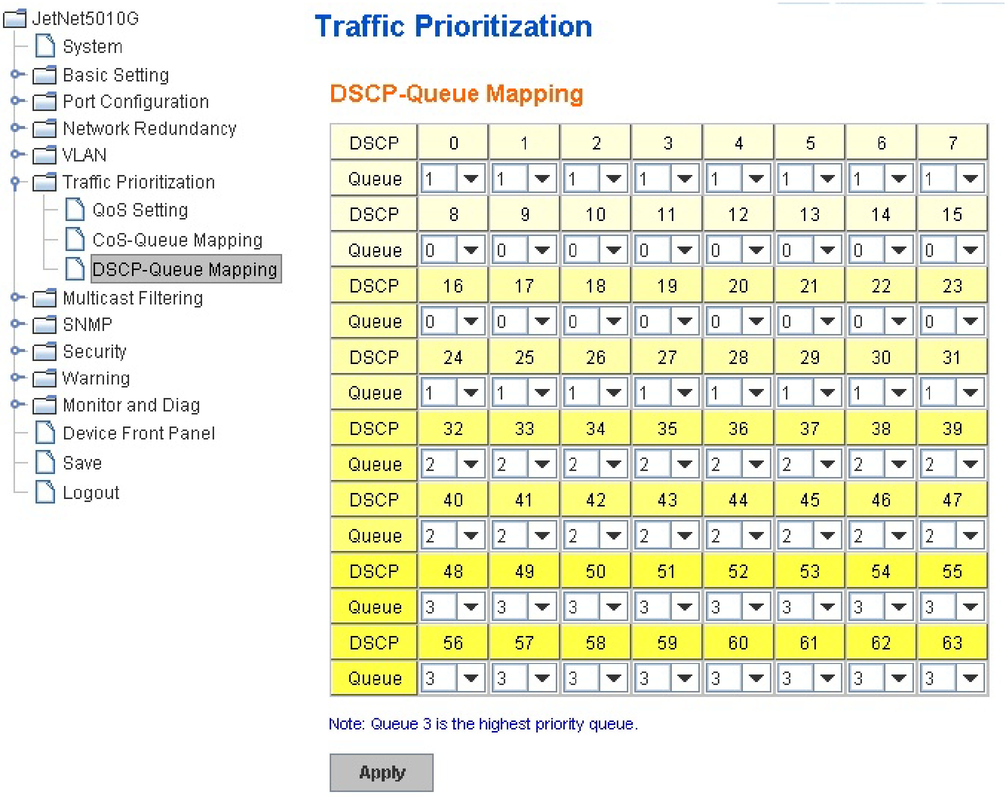
CoS	0	1	2	3	4	5	6	7
Queue	1	0	0	1	2	2	3	3

Note: Queue 3 is the highest priority queue.

After configuration, press **Apply** to enable the settings.

4.7.3 DSCP-Queue Mapping

This page is to change DSCP values to Physical Queue mapping table. Since the switch fabric of JetNet only supports 4 physical queues, Lowest, Low, Middle and High. Users should therefore assign how to map DSCP value to the level of the physical queue. In JetNet, users can freely change the mapping table to follow the upper layer 3 switch or routers' DSCP setting.



Traffic Prioritization

DSCP-Queue Mapping

DSCP	0	1	2	3	4	5	6	7
Queue	1	1	1	1	1	1	1	1
DSCP	8	9	10	11	12	13	14	15
Queue	0	0	0	0	0	0	0	0
DSCP	16	17	18	19	20	21	22	23
Queue	0	0	0	0	0	0	0	0
DSCP	24	25	26	27	28	29	30	31
Queue	1	1	1	1	1	1	1	1
DSCP	32	33	34	35	36	37	38	39
Queue	2	2	2	2	2	2	2	2
DSCP	40	41	42	43	44	45	46	47
Queue	2	2	2	2	2	2	2	2
DSCP	48	49	50	51	52	53	54	55
Queue	3	3	3	3	3	3	3	3
DSCP	56	57	58	59	60	61	62	63
Queue	3	3	3	3	3	3	3	3

Note: Queue 3 is the highest priority queue.

After configuration, press **Apply** to enable the settings.

4.7.4 CLI Commands of the Traffic Prioritization

Command Lines of the Traffic Prioritization configuration

Feature	Command Line
QoS Setting	
Queue Scheduling – Strict Priority	Switch(config)# qos queue-sched sp Strict Priority wrr Weighted Round Robin (Use an 8,4,2,1 weight) Switch(config)# qos queue-sched sp <cr>
Queue Scheduling - WRR	Switch(config)# qos queue-sched wrr
Port Setting – CoS (Default Port Priority)	Switch(config)# interface **fa1** Switch(config-if)# qos cos

	DEFAULT-COS Assign an priority (7 highest) Switch(config-if)# qos cos 7 The default port CoS value is set 7 ok. ***Note: When change the port setting, you should Select the specific port first. Ex: fa1 means fast Ethernet port 1.***
Port Setting – Trust Mode- CoS Only	Switch(config)# interface fa1 Switch(config-if)# qos trust cos The port trust is set CoS only ok.
Port Setting – Trust Mode- CoS First	Switch(config)# interface fa1 Switch(config-if)# qos trust cos-first The port trust is set CoS first ok.
Port Setting – Trust Mode- DSCP Only	Switch(config)# interface fa1 Switch(config-if)# qos trust dscp The port trust is set DSCP only ok.
Port Setting – Trust Mode- DSCP First	Switch(config)# interface fa1 Switch(config-if)# qos trust dscp-first The port trust is set DSCP first ok.
Display – Queue Scheduling	Switch# show qos queue-sched QoS queue scheduling scheme : Weighted Round Robin (Use an 8,4,2,1 weight)
Display – Port Setting - Trust Mode	Switch# show qos trust QoS Port Trust Mode : Port Trust Mode -----+------------ 1 DSCP first 2 COS only 3 COS only 4 COS only 5 COS only 6 COS only 7 COS only 8 COS only 9 COS only 10 COS only
Display – Port Setting – CoS (Port Default Priority)	Switch# show qos port-cos Port Default Cos : Port CoS -----+---- 1 7 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0
CoS-Queue Mapping	
Format	Switch(config)# qos cos-map PRIORITY Assign an priority (7 highest) Switch(config)# qos cos-map 1 QUEUE Assign an queue (0-3) ***Note: Format: qos cos-map priority_value queue_value***

Map CoS 0 to Queue 1	Switch(config)# qos cos-map 0 1 The CoS to queue mapping is set ok.
Map CoS 1 to Queue 0	Switch(config)# qos cos-map 1 0 The CoS to queue mapping is set ok.
Map CoS 2 to Queue 0	Switch(config)# qos cos-map 2 0 The CoS to queue mapping is set ok.
Map CoS 3 to Queue 1	Switch(config)# qos cos-map 3 1 The CoS to queue mapping is set ok.
Map CoS 4 to Queue 2	Switch(config)# qos cos-map 4 2 The CoS to queue mapping is set ok.
Map CoS 5 to Queue 2	Switch(config)# qos cos-map 5 2 The CoS to queue mapping is set ok.
Map CoS 6 to Queue 3	Switch(config)# qos cos-map 6 3 The CoS to queue mapping is set ok.
Map CoS 7 to Queue 3	Switch(config)# qos cos-map 7 3 The CoS to queue mapping is set ok.

Display – CoS-Queue mapping	Switch# sh qos cos-map
	CoS to Queue Mapping :
	CoS Queue
	  ---- + ------
	    0 1
	    1 0
	    2 0
	    3 1
	    4 2
	    5 2
	    6 3
	    7 3

DSCP-Queue Mapping	
Format	Switch(config)# qos dscp-map PRIORITY Assign an priority (63 highest) Switch(config)# qos dscp-map 0 QUEUE Assign an queue (0-3) ***Format: qos dscp-map priority_value queue_value***
Map DSCP 0 to Queue 1	Switch(config)# qos dscp-map 0 1 The TOS/DSCP to queue mapping is set ok.

Display – DSCO-Queue mapping	Switch# show qos dscp-map
	DSCP to Queue Mapping : (dscp = d1 d2)
	
	    d2| 0 1 2 3 4 5 6 7 8 9
	d1 |
	-----+----------------------
	    0 | 1 1 1 1 1 1 1 1 0 0
	    1 | 0 0 0 0 0 0 0 0 0 0
	    2 | 0 0 0 0 1 1 1 1 1 1
	    3 | 1 1 2 2 2 2 2 2 2 2
	    4 | 2 2 2 2 2 2 2 2 3 3
	    5 | 3 3 3 3 3 3 3 3 3 3
	    6 | 3 3 3 3

4.8 Multicast Filtering

For multicast filtering, JetNet 5010G uses IGMP Snooping technology. IGMP (Internet Group Management Protocol) is an Internet Protocol that provides a way for internet device to report its multicast group membership to adjacent routers. Multicasting allows one computer on the internet to send data to a multitude of other computers that have identified themselves as being interested in receiving the originating computers data.

Multicasting is useful for such applications as updating the address books of mobile computer users in the field, sending out newsletters to a distribution list, and broadcasting streaming media to an audience that has tuned into the event by setting up multicast group membership.

In effect, IGMP Snooping manages multicast traffic by making use of switches, routers, and hosts that support IGMP. Enabling IGMP Snooping allows the ports to detect IGMP queries, report packets, and manage multicast traffic through the switch. IGMP has three fundamental types of messages, as shown below:

Message	Description
Query	A message sent from the querier (an IGMP router or a switch) which asks for a response from each host that belongs to the multicast group.
Report	A message sent by a host to the querier to indicate that the host wants to be or is a member of a given group indicated in the report message.
Leave Group	A message sent by a host to the querier to indicate that the host has quit as a member of a specific multicast group.

You can enable **IGMP Snooping** and **IGMP Query** functions here. You will see the information of the IGMP Snooping function in this section, including different multicast groups' VID and member ports, and IP multicast addresses that range from 224.0.0.0 to 239.255.255.255.

In this section, Force filtering can determined whether the switch flooding unknown multicast or not.

Following commands are included in this group:

4.7.1 IGMP Snooping

4.7.2 IGMP Query

4.7.3 Force Filtering

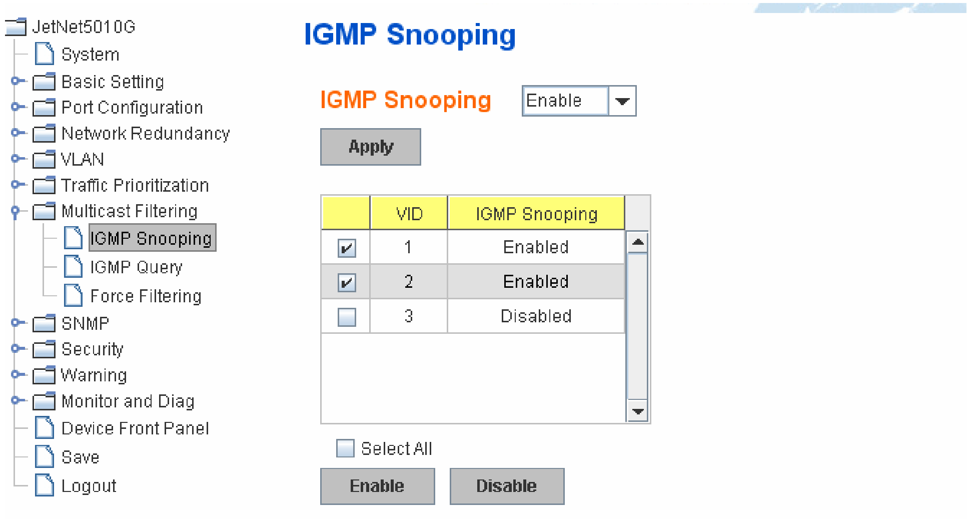
4.7.4 CLI Commands of the Multicast Filtering

4.8.1 IGMP Snooping

This page is to enable IGMP Snooping feature, assign IGMP Snooping for specific VLAN, and view IGMP Snooping table from dynamic learnt or static manual key-in. JetNet5010G support IGMP snooping V1/V2/V3 automatically and IGMP query V1/V2.

IGMP Snooping, you can select **Enable** or **Disable** here. After enabling IGMP Snooping, you can then enable IGMP Snooping for specific VLAN. You can enable IGMP Snooping for some VLANs so that some of the VLANs will support IGMP Snooping and others won't.

To assign IGMP Snooping to VLAN, please select the **checkbox** of VLAN ID or select **Select All** checkbox for all VLANs. Then press **Enable**. In the same way, you can also **Disable** IGMP Snooping for certain VLANs.



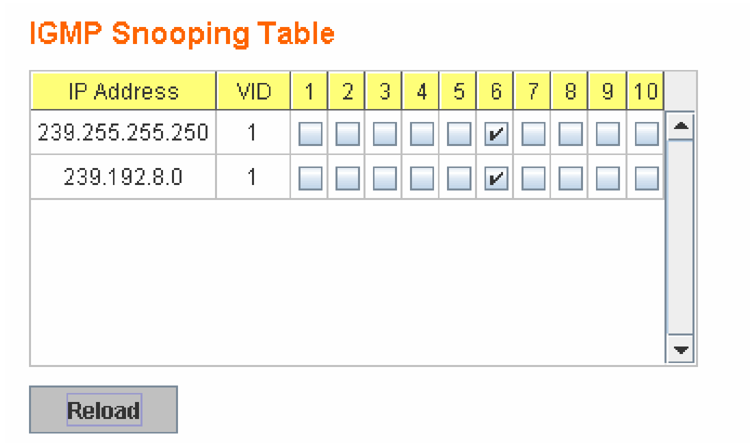
IGMP Snooping

IGMP Snooping: Enable

	VID	IGMP Snooping
☑	1	Enabled
☑	2	Enabled
□	3	Disabled

□ Select All

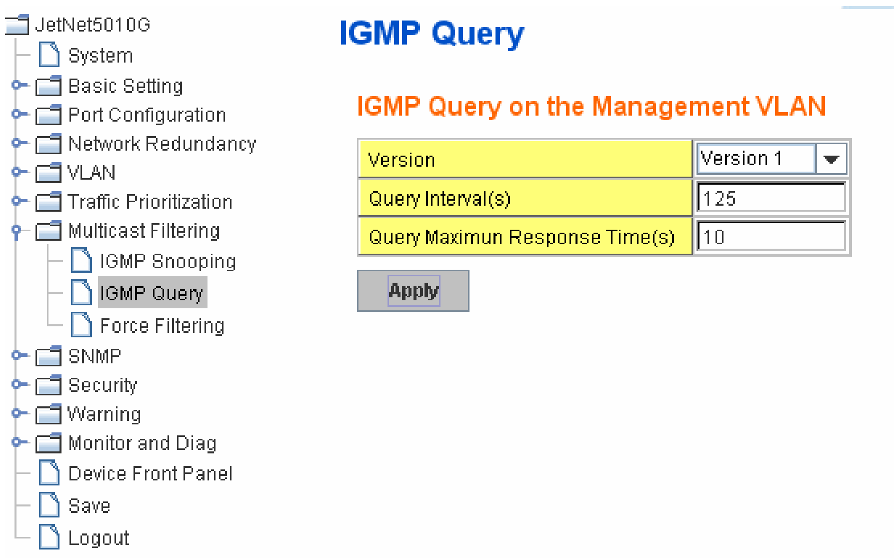
IGMP Snooping Table: In the table, you can see multicast group IP address, VLAN ID it belongs to, and member ports of the multicast group. JetNet 5010G supports 256 multicast groups. Click on **Reload** to refresh the table.



IGMP Snooping Table

IP Address	VID	1	2	3	4	5	6	7	8	9	10
239.255.255.250	1	□	□	□	□	□	☑	□	□	□	□
239.192.8.0	1	□	□	□	□	□	☑	□	□	□	□

4.8.2 IGMP Query



IGMP Query

IGMP Query on the Management VLAN

Version	Version 1
Query Interval(s)	125
Query Maximun Response Time(s)	10

This page allows users to configure **IGMP Query** feature. Since JetNet 5010G can only be configured by member ports of the management VLAN, IGMP Query can only be enabled on the management VLAN. If you want to run IGMP Snooping feature in several VLANs, you should notice that whether each VLAN has its own IGMP Querier first.

The IGMP querier periodically sends query packets to all end-stations on the LANs or VLANs that are connected to it. For networks with more than one IGMP querier, a switch with the lowest IP address becomes the IGMP querier.

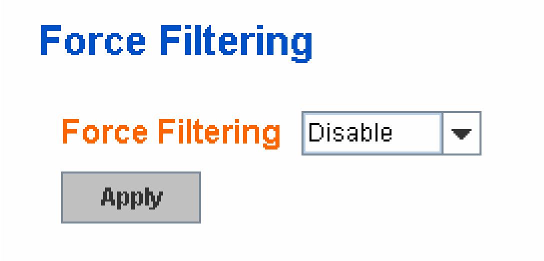
In IGMP Query selection, you can select V1, V2 or Disable. **V1** means IGMP V1 General Query and **V2** means IGMP V2 General Query.. The query will be forwarded to all multicast groups in the VLAN. **Disable** allows you to disable IGMP Query.

Query Interval(s): The period of query sent by querier.

Query Maximum Response Time: The span querier detect to confirm there are no more directly connected group members on a LAN.

Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.8.3 Force Filtering



Force Filtering

Force Filtering: Disable

The Force filtering function allows the switch to filter the unknown-multicast data flow. If Force filtering is enabled, all the unknown multicast data will be discarded.

4.8.4 CLI Commands of the Multicast Filtering

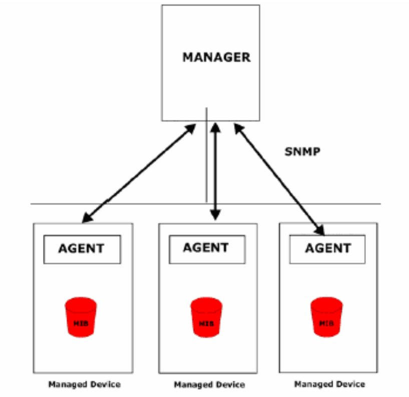
Command Lines of the multicast filtering configuration

Feature	Command Line
IGMP Snooping	
IGMP Snooping - Global	Switch(config)# ip igmp snooping IGMP snooping is enabled globally. Please specify on which vlans IGMP snooping enables
IGMP Snooping - VLAN	Switch(config)# ip igmp snooping vlan VLANLIST allowed vlan list all all existed vlan Switch(config)# ip igmp snooping vlan 1-2 IGMP snooping is enabled on VLAN 1-2.
Disable IGMP Snooping - Global	Switch(config)# no ip igmp snoopin IGMP snooping is disabled globally ok.
Disable IGMP Snooping - VLAN	Switch(config)# no ip igmp snooping vlan 3 IGMP snooping is disabled on VLAN 3.
Display – IGMP Snooping Setting	Switch# sh ip igmp interface vlan1 enabled: Yes version: IGMPv1 query-interval; 125s query-max-response-time: 10s Switch# sh ip igmp snooping

	IGMP snooping is globally enabled Vlan1 is IGMP snooping enabled Vlan2 is IGMP snooping enabled Vlan3 is IGMP snooping disabled
Display – IGMP Table	Switch# sh ip igmp snooping multicast all VLAN IP Address Type Ports ---- --------------- ------- ------------------------ 1 239.192.8.0 IGMP fa6, 1 239.255.255.250 IGMP fa6,
IGMP Query	
IGMP Query V1	Switch(config)# int vlan 1 (Go to management VLAN) Switch(config-if)# ip igmp v1
IGMP Query V2	Switch(config)# int vlan 1 (Go to management VLAN) Switch(config-if)# ip igmp
IGMP Query version	Switch(config-if)# ip igmp version 1 Switch(config-if)# ip igmp version 2
Disable	Switch(config)# int vlan 1 Switch(config-if)# no ip igmp
Display	Switch# sh ip igmp interface vlan1 enabled: Yes version: IGMPv2 query-interval: 125s query-max-response-time: 10s Switch# show running-config …. ! interface vlan1 ip address 192.168.10.17/24 ip igmp no shutdown ! …….
Force filtering	
Enable Force filtering Disable Force filtering	Switch(config)# mac-address-table multicast filtering Filtering unknown multicast addresses ok! Switch(config)# no mac-address-table multicast filtering Flooding unknown multicast addresses ok!

4.9 SNMP

Simple Network Management Protocol (SNMP) is a protocol used for exchanging management information between network devices. SNMP is a member of the TCP/IP protocol suite. JetNet 5010G series support SNMP v1 and v2c and V3.



An SNMP managed network consists of two main components: agents and a manager. An agent is a management software module that resides in a managed switch. An agent translates the local management information from the managed device into a SNMP compatible format. The manager is the console through the network.

Following commands are included in this group:

4.8.1 SNMP Configuration

4.8.2 SNMPv3 Profile

4.8.3 SNMP Traps

4.8.4 SNMP CLI Commands for SNMP

4.9.1 SNMP Configuration

This page allows users to configure SNMP V1/V2c Community. The community string can be viewed as the password because SNMP V1/V2c doesn't request you to enter password before you try to access SNMP agent.

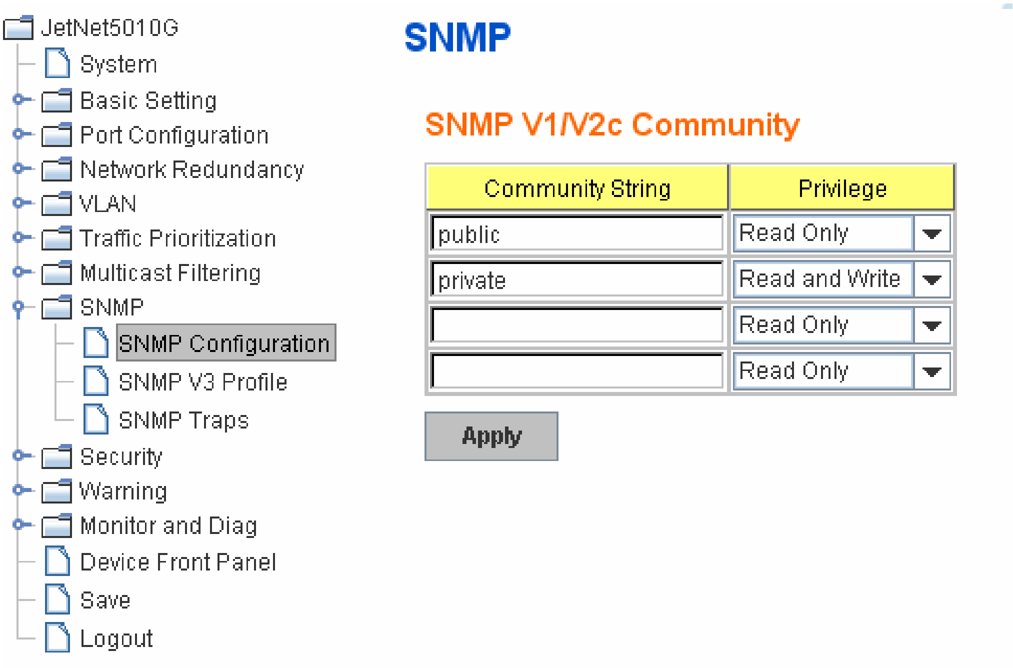
The community includes 2 privileges, Read Only and Read and Write.

With **Read Only** privilege, you only have the ability to read the values of MIB tables. Default community string is Public.

With **Read and Write** privilege, you have the ability to read and set the values of MIB tables. Default community string is Private.

JetNet 5010G allows users to assign 4 community strings. Type the community string and select the privilege. Then press **Apply**.

Note: *When you first install the device in your network, we highly recommend you to change the community string. Since most SNMP management application uses Public and Private as their default community name, this might be the leakage of the network security.*



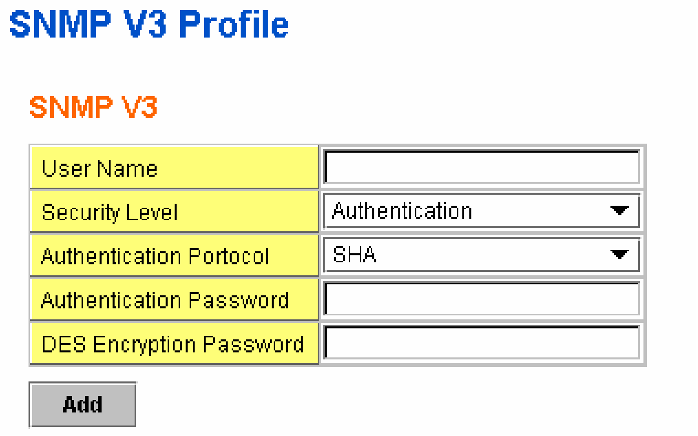
SNMP

SNMP V1/V2c Community

Community String	Privilege
public	Read Only
private	Read and Write
	Read Only
	Read Only

4.9.2 SNMP V3 Profile

SNMP v3 can provide more security functions when the user performs remote management through SNMP protocol. It delivers SNMP information to the administrator with user authentication; all of data between *JetNet 5010G* and the administrator are encrypted to ensure secure communication.



SNMP V3 Profile

SNMP V3

User Name	
Security Level	Authentication
Authentication Portocol	SHA
Authentication Password	
DES Encryption Password	

Security Level: Here the user can select the following levels of security: None, User Authentication, and Authentication with privacy.

Authentication Protocol: Here the user can select either MD5 (Message-Digest algorithm 5) or SHA (Secure Hash Algorithm). MD5 is a widely used cryptographic hash function with a 128-bit hash value. SHA (Secure Hash Algorithm) hash functions refer to five Federal Information Processing Standard-approved algorithms for computing a condensed digital representation. *JetNet 5010G* provides 2 user authentication protocols in MD5 and SHA. You will need to configure SNMP v3 parameters for your SNMP tool with the same authentication method.

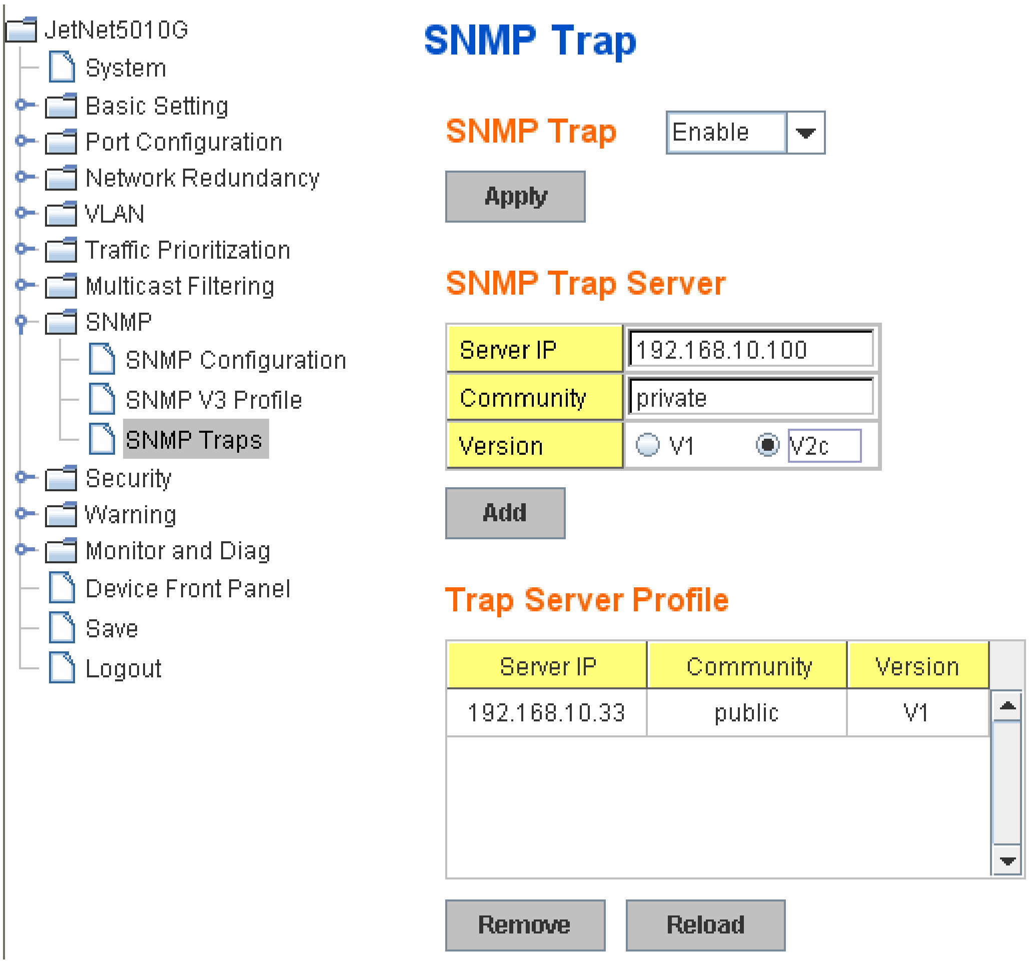
Authentication Password: Here the user enters the SNMP v3 user authentication password.

DES Encryption Password: Here the user enters the password for SNMP v3 user DES Encryption.

4.9.3 SNMP Traps

SNMP Trap is the notification feature defined by SNMP protocol. All the SNMP management applications can understand such trap information. So you don't need to install new application to read the notification information.

This page allows users to **Enable SNMP Trap,** configure the **SNMP Trap server IP**, **Community** name, and trap **Version V1 or V2**. After configuration, you can see the change of the SNMP pre-defined standard traps and Korenix pre-defined traps. The pre-defined traps can be found in Korenix private MIB.



SNMP Trap

SNMP Trap: Enable

SNMP Trap Server

Server IP	192.168.10.100
Community	private
Version	○ V1 ● V2c

Trap Server Profile

Server IP	Community	Version
192.168.10.33	public	V1

4.9.4 CLI Commands of the SNMP

Command Lines of the SNMP configuration

Feature	Command Line
SNMP Community	
Read Only Community	Switch(config)# snmp-server community public ro community string add ok
Read Write Community	Switch(config)# snmp-server community private rw community string add ok
SNMP Trap	
Enable Trap	Switch(config)# snmp-server enable trap Set SNMP trap enable ok.
SNMP Trap Server IP without specific community name	Switch(config)# snmp-server host 192.168.10.33 SNMP trap host add OK.
SNMP Trap Server IP with version 1 and community	Switch(config)# snmp-server host 192.168.10.33 version 1 private SNMP trap host add OK. ***Note: private is the community name, version 1 is the SNMP version***
SNMP Trap Server IP with version 2 and community	Switch(config)# snmp-server host 192.168.10.33 version 2 private SNMP trap host add OK.
Disable SNMP Trap	Switch(config)# no snmp-server enable trap Set SNMP trap disable ok.
Display	Switch# sh snmp-server trap SNMP trap: Enabled SNMP trap community: public Switch# show running-config .... snmp-server community public ro snmp-server community private rw snmp-server enable trap snmp-server host 192.168.10.33 version 2 admin snmp-server host 192.168.10.33 version 1 admin ……..

4.10 Security

JetNet 5010G provides several security features for you to secure your connection. The features include Port Security and IP Security.

Following commands are included in this group:

4.9.1 Port Security

4.9.2 IP Security

4.9.3 IEEE 802.1x

4.9.4 CLI Commands of the Security

4.10.1 Port Security

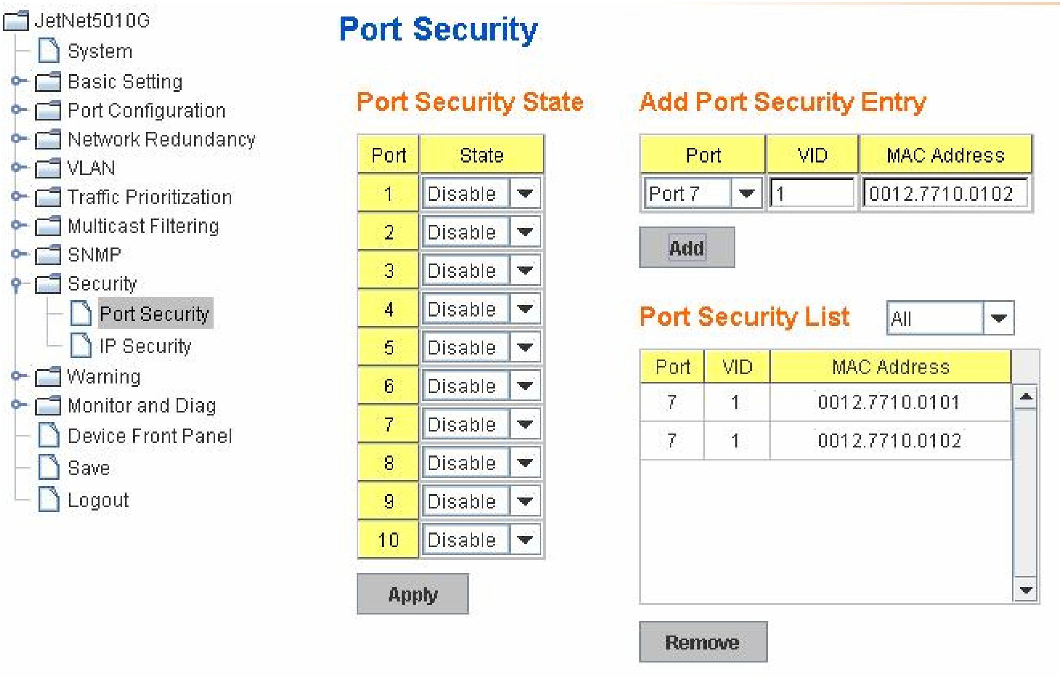
Port Security feature allows you to stop the MAC address learning for specific port. After stopping MAC learning, only the MAC address listed in Port Security List can access the switch and transmit/receive traffic. This is a simple way to secure your network environment and not to be accessed by hackers.

This page allows you to enable Port Security and configure Port Security entry.

Port Security State: Change Port Security State of the port to Enable first.

Add Port Security Entry: Select the port, and type VID and MAC address. Format of the MAC address is xxxx.xxxx.xxxx. Ex: 0012.7701.0101. Max volume of one port is 10. So the system can accept 100 Port Security MAC addresses in total.

Port Security List: This table shows you those enabled port security entries. You can click on **Remove** to delete the entry.



Port Security

Port Security State

Port	State
1	Disable
2	Disable
3	Disable
4	Disable
5	Disable
6	Disable
7	Disable
8	Disable
9	Disable
10	Disable

Add Port Security Entry

Port	VID	MAC Address
Port 7	1	0012.7710.0102

Port Security List: All

Port	VID	MAC Address
7	1	0012.7710.0101
7	1	0012.7710.0102

Once you finish configuring the settings, click on **Apply / Add** to apply your configuration.

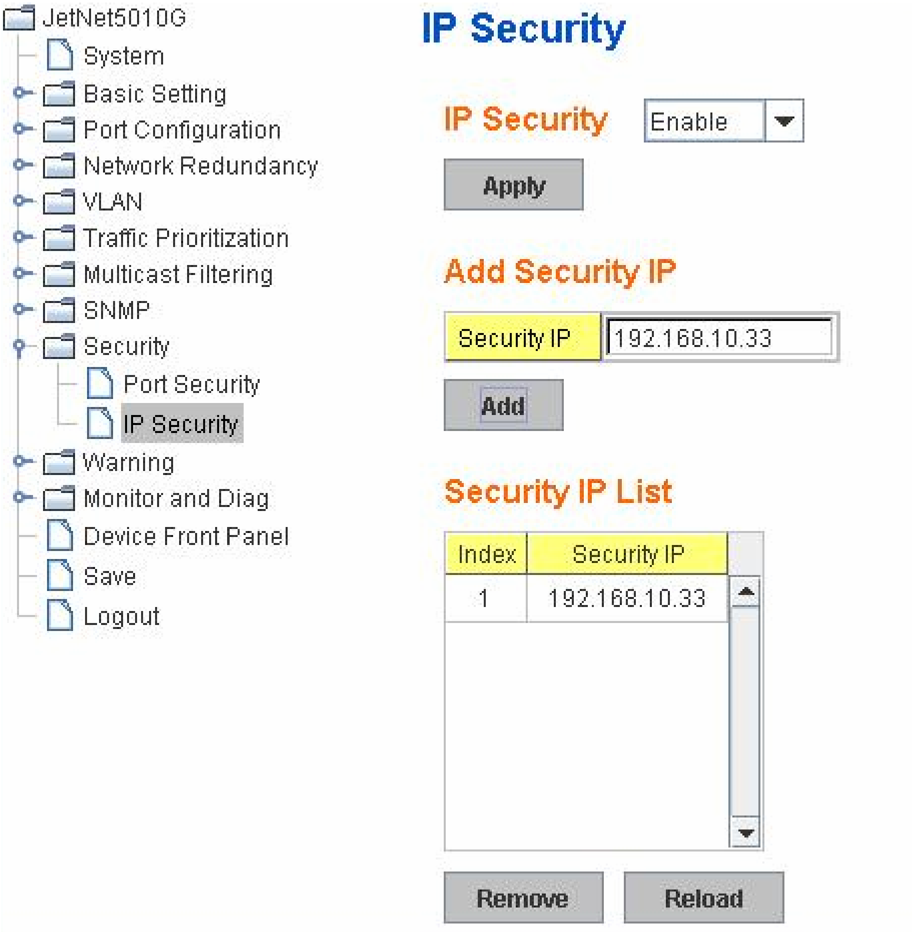
4.10.2 IP Security

In IP Security section, you can set up specific IP addresses to grant authorization for management access to this JetNet via a web browser or Telnet.

IP Security: Select Enable and **Apply** to enable IP security function.

Add Security IP: You can assign specific IP addresses, and then press **Add**. Only these IP addresses can access and manage JetNet via a web browser or Telnet. Max security IP is 10.

Security IP List: This table shows you added security IP addresses. You can press **Remove** to delete, **Reload** to reload the table.



IP Security: Enable

Security IP: 192.168.10.33

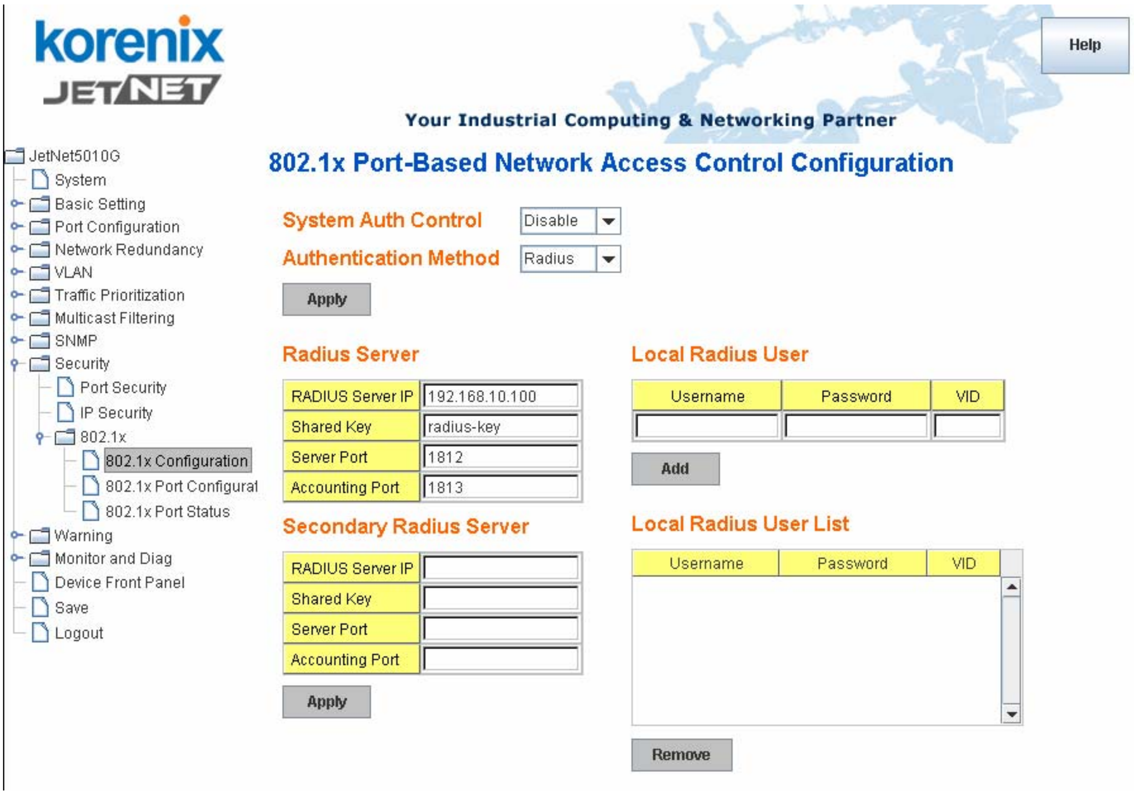
Index	Security IP
1	192.168.10.33

Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.10.3 IEEE 802.1x

4.9.3.1 802.1X configuration

IEEE 802.1X is the protocol that performing authentication to obtain access to IEEE 802 LANs. It is port-base network access control. With the function, JetNet 5010G could control which connection is available or not.



802.1x Port-Based Network Access Control Configuration

System Auth Control: Disable

Authentication Method: Radius

Radius Server

RADIUS Server IP	192.168.10.100
Shared Key	radius-key
Server Port	1812
Accounting Port	1813

Secondary Radius Server

RADIUS Server IP	
Shared Key	
Server Port	
Accounting Port	

Local Radius User

Username	Password	VID

Local Radius User List

Username	Password	VID

System AuthControl: To enable or disable the 802.1x authentication.

Authentication Method: Radius is a authentication server that provide key for authentication, with this method, user must connect switch to server. If user select Local for the authentication method, switch use the local user data base which can be create in this page for authentication.

Radius Server IP: The IP address of Radius server

Shared Key: The password for communicate between switch and Radius Server.

Server Port: UDP port of Radius server.

Accounting Port: Port for packets that contain the information of account login or logout.

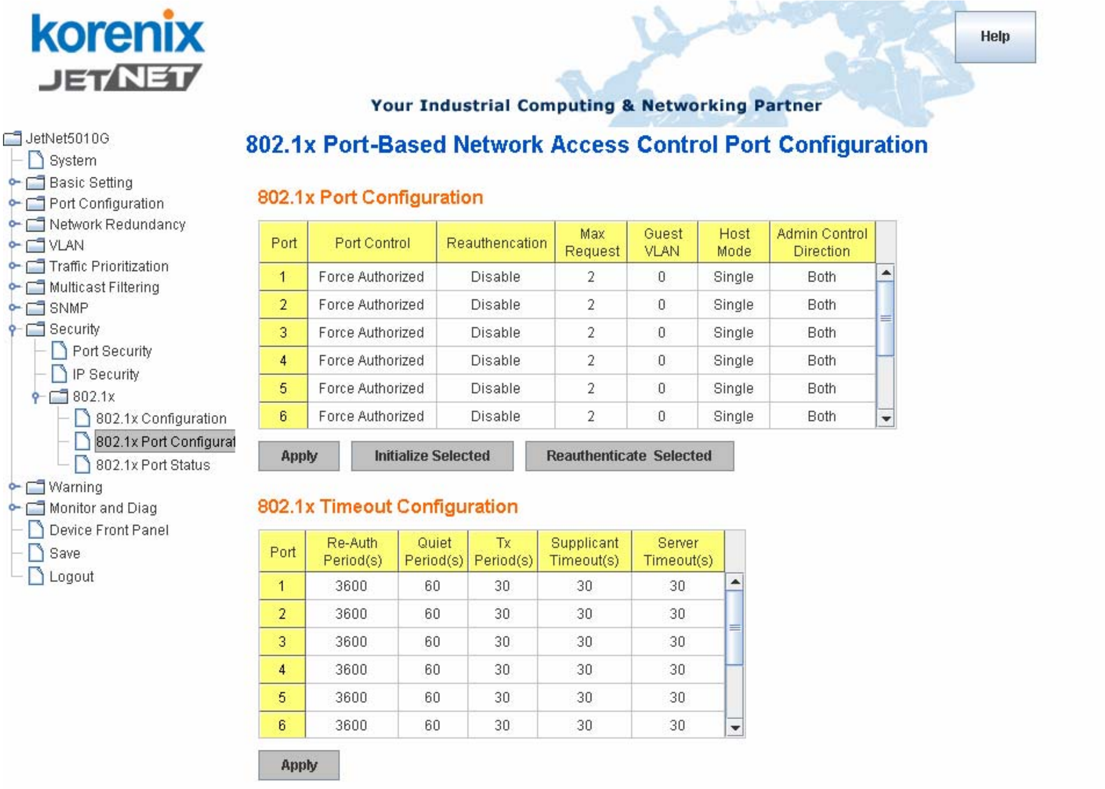
Secondary Radius Server IP: Secondary Radius Server could be set in case of the primary radius server down.

802.1X Local User: Here User can add Account/Password for local authentication.

802.1X Local user List: This is a list shows the account information, User also can remove selected account Here.

4.9.3.2 802.1x Port Configuration

After the configuration of Radius Server or Local user list, user also need configure the authentication mode, authentication behavior, applied VLAN for each port and permitted communication. The following information will explain the port configuration.



802.1x Port-Based Network Access Control Port Configuration

802.1x Port Configuration

Port	Port Control	Reauthencation	Max Request	Guest VLAN	Host Mode	Admin Control Direction
1	Force Authorized	Disable	2	0	Single	Both
2	Force Authorized	Disable	2	0	Single	Both
3	Force Authorized	Disable	2	0	Single	Both
4	Force Authorized	Disable	2	0	Single	Both
5	Force Authorized	Disable	2	0	Single	Both
6	Force Authorized	Disable	2	0	Single	Both

802.1x Timeout Configuration

Port	Re-Auth Period(s)	Quiet Period(s)	Tx Period(s)	Supplicant Timeout(s)	Server Timeout(s)
1	3600	60	30	30	30
2	3600	60	30	30	30
3	3600	60	30	30	30
4	3600	60	30	30	30
5	3600	60	30	30	30
6	3600	60	30	30	30

Port control: Force Authorized means this port is authorized; the data is free to in/out. Force unauthorized just opposite, the port is blocked. If users want to control this port with Radius Server, please select Auto for port control.

Reauthentication: If enable this field, switch will ask client to re-authenticate. The default time interval is 3600 seconds.

Max Request: the maximum times that the switch allow client request.

Guest VLAN: 0 to 4094 is available for this field. If this field is set to 0, that means the port is blocked after authentication fail. Otherwise, the port will be set to Guest VLAN.

Host Mode: if there are more than one device connected to this port, set the Host Mode to single means only the first PC authenticate success can access this port. If this port is set to multi, all the device can access this port once any one of them pass the authentication.

Control Direction: determined devices can end data out only or both send and receive.

Re-Auth Period: control the Re-authentication time interval, 1~65535 is available.

Quiet Period: When authentication failed, Switch will wait for a period and try to communicate with radius server again.

Tx period: the time interval of authentication request.

Supplicant Timeout: the timeout for the client authenticating

Sever Timeout: The timeout for server response for authenticating.

Once you finish configuring the settings, click on **Apply** to apply your configuration.

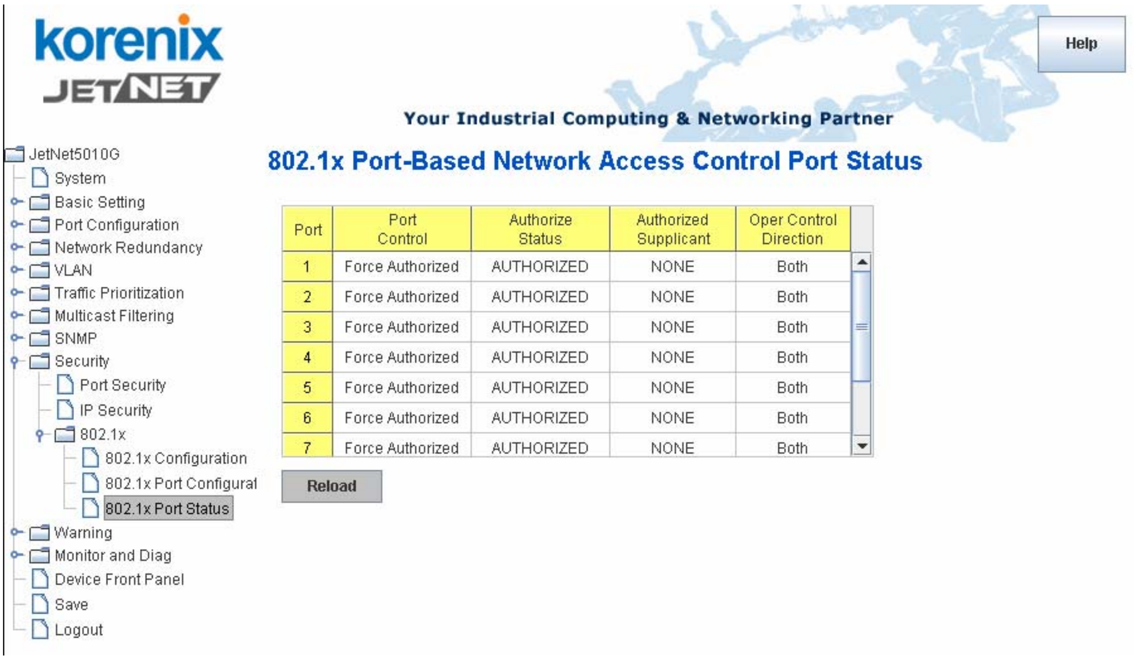
Click **Initialize Selected** to set the authorize state of selected port to initialize status.

Click **Reauthenticate Selected** to send EAP Request to supplicant to request reauthentication.

Click **Default Selected** to reset the configurable 802.1x parameters of selected port to the default values.

4.9.3.3 802.1X Port Status

Here user can observe the port status for Port control status, Authorize Status, Authorized Supplicant and Oper Control Direction each port.



802.1x Port-Based Network Access Control Port Status

Port	Port Control	Authorize Status	Authorized Supplicant	Oper Control Direction
1	Force Authorized	AUTHORIZED	NONE	Both
2	Force Authorized	AUTHORIZED	NONE	Both
3	Force Authorized	AUTHORIZED	NONE	Both
4	Force Authorized	AUTHORIZED	NONE	Both
5	Force Authorized	AUTHORIZED	NONE	Both
6	Force Authorized	AUTHORIZED	NONE	Both
7	Force Authorized	AUTHORIZED	NONE	Both

4.10.4 CLI Commands of the Security

Command Lines of the Security configuration

Feature	Command Line
Port Security	
Add MAC	Switch(config)# mac-address-table static 0012.7701.0101 vlan 1 interface fa1 mac-address-table unicast static set ok!

Port Security	Switch(config)# interface fa1 Switch(config-if)# switchport port-security Disables new MAC addresses learning and aging activities! ***Note: Rule: Add the static MAC, VLAN and Port binding first, then enable the port security to stop new MAC learning.***
Disable Port Security	Switch(config-if)# no switchport port-security Enable new MAC addresses learning and aging activities!
Display	Switch# show mac-address-table static Destination Address Address Type Vlan Destination Port ------------------- --------------- ------- ------------------------ 0012.7701.0101 Static 1 fa1
IP Security	
IP Security	Switch(config)# ip security Set ip security enable ok. Switch(config)# ip security host 192.168.10.33 Add ip security host 192.168.10.33 ok.
Display	Switch# show ip security ip security is enabled ip security host: 192.168.10.33
802.1x	
enable diable	Switch(config)# dot1x system-auth-control Switch(config)# Switch(config)# no dot1x system-auth-control Switch(config)#
authentic-method	Switch(config)# dot1x authentic-method local Use the local username database for authentication radius Use the Remote Authentication Dial-In User Service (RADIUS) servers for authentication Switch(config)# dot1x authentic-method radius Switch(config)#
radius server-ip	Switch(config)# dot1x radius Switch(config)# dot1x radius server-ip 192.168.10.120 key 1234 RADIUS Server Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) RADIUS Server IP : 192.168.10.120 RADIUS Server Key : 1234 RADIUS Server Port : 1812 RADIUS Accounting Port : 1813 Switch(config)#
radius server-ip	Switch(config)# dot1x radius Switch(config)# dot1x radius server-ip 192.168.10.120 key 1234 RADIUS Server Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) RADIUS Server IP : 192.168.10.120 RADIUS Server Key : 1234 RADIUS Server Port : 1812 RADIUS Accounting Port : 1813 Switch(config)#

radius secondary-server-ip	Switch(config)# dot1x radius secondary-server-ip 192.168.10.250 key 5678 Port number NOT given. (default=1812) RADIUS Accounting Port number NOT given. (default=1813) Secondary RADIUS Server IP : 192.168.10.250 Secondary RADIUS Server Key : 5678 Secondary RADIUS Server Port : 1812 Secondary RADIUS Accounting Port : 1813
User name/password for authentication	Switch(config)# dot1x username korenix passwd korenix vlan 1

4.11 Warning

JetNet 5010G provides several types of Warning features for you to remote monitor the status of end devices or the change of your network. The features include Fault Relay, System Log and SMTP E-mail Alert.

Following commands are included in this group:

4.10.1 Fault Relay

4.10.2 Event Selection

4.10.3 Syslog Configuration

4.10.4 SMTP Configuration

4.10.5 CLI Commands

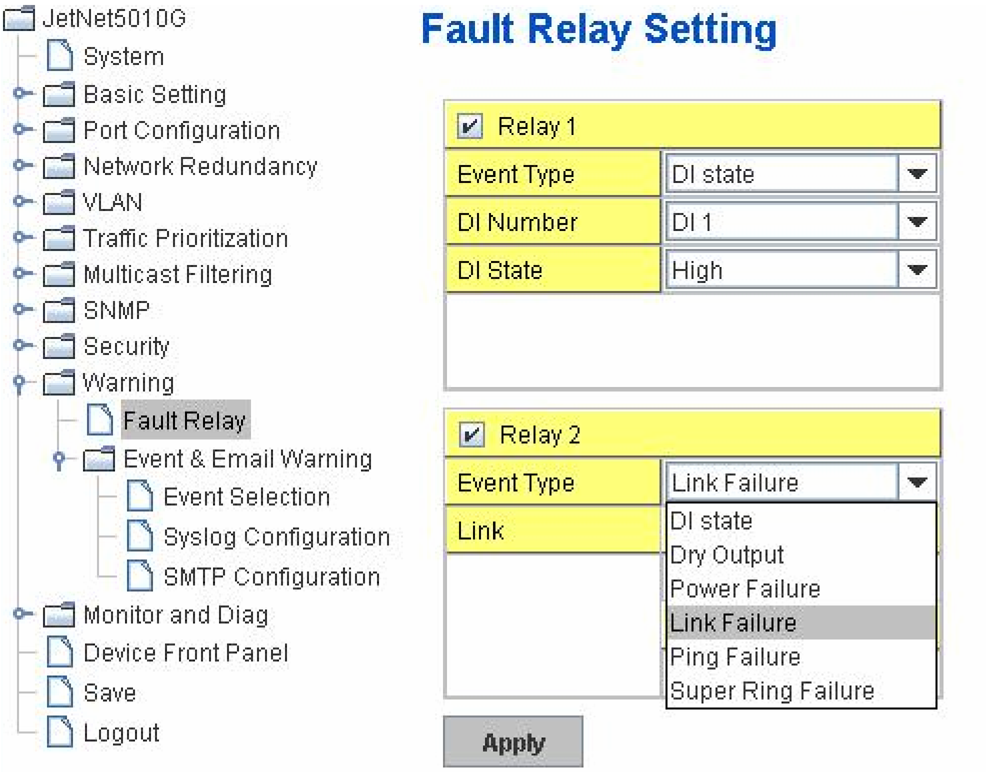
4.11.1 Fault Relay

JetNet 5010G provides 2 digital outputs, also known as Relay Output. The relay contacts are energized (open) for normal operation and will close under fault conditions. Fault conditions include DI State change, Periodical On/Off, Power Failure, Ethernet port Link Failure, Ping Failure and Super Ring Topology Change. You can configure these settings in this Fault Relay Setting. Each Relay can be assigned 1 fault condition.

Relay 1: Click on checkbox of the Relay 1, then select the Event Type and its parameters.

Relay 2: Click on checkbox of the Relay 2, then select the Event Type and its parameters.

Event Type: DI State, Dry Output, Power Failure, Link Failure, Ping Failure and Super Ring Failure. Each event type has its own parameters. You should also configure them. Currently, each Relay can has one event type.



Fault Relay Setting

☑ Relay 1

Event Type	DI state
DI Number	DI 1
DI State	High

☑ Relay 2

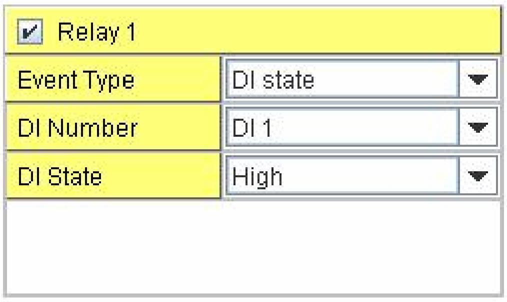
Event Type	Link Failure
Link	

Event Type: **DI State**

DI Number: Select DI 1 or DI 2. Select which DI you want to monitor.

DI State: High or Low. Select the power voltage you want to monitor.

How to configure: Select the DI Number you want to monitor and DI State, High or Low. For example: When DI 1 and High are selected, it means when DI 1 is pulled high, the system will short Relay Output and light DO LED.



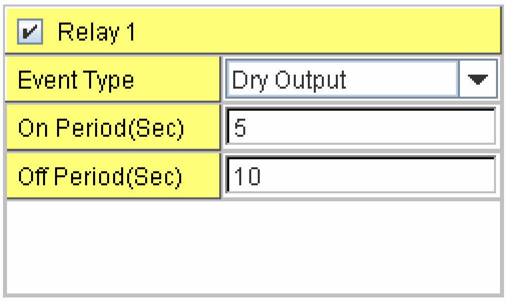
☑ Relay 1	
Event Type	DI state
DI Number	DI 1
DI State	High

Event Type: **Dry Output**

On Period (Sec): Type the period time to turn on Relay Output. Available range of a period is 0-4294967295 seconds.

Off Period (Sec): Type the period time to turn off Relay Output. Available range of a period is 0-4294967295 seconds.

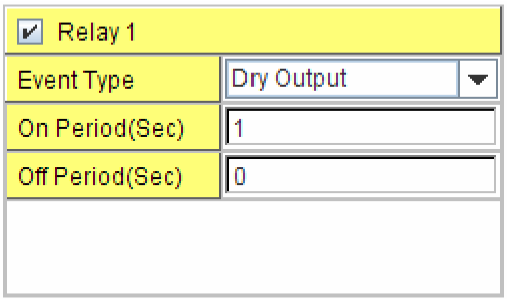
How to configure: Type turn-on period and turn-off period when the time is reached, the system will turn on or off the Relay Output. If you connect DO to DI of the other terminal unit, the setting can help you to change DI state. If you connect DO to the power set of other terminal units, this setting can help you to turn on or off the unit.



☑ Relay 1	
Event Type	Dry Output
On Period(Sec)	5
Off Period(Sec)	10

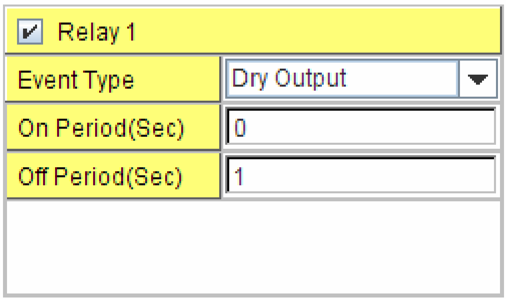
Relay turn on for 5 seconds then off for 10 seconds

How to turn On/Off the other device: Type “1” into the “On period” field and “0” into “Off Period” field and apply the setting, then it t will be trigger to form as a close circuit.
To turn off the relay, just type “0” into the “On period” field and “1” into “Off Period” field and apply the setting, the relay will be trigger to form as a open circuit.
This function is also available in CLI, SNMP management interface. See the following setting.



☑ Relay 1	
Event Type	Dry Output
On Period(Sec)	1
Off Period(Sec)	0

Turn on the relay output

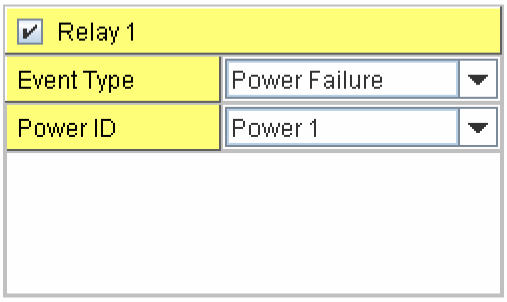


☑ Relay 1	
Event Type	Dry Output
On Period(Sec)	0
Off Period(Sec)	1

Turn off the relay output

Event Type: **Power Failure**

Power ID: Select Power 1 or Power 2 you want to monitor. When the power is shut down or broken, the system will short Relay Out and light the DO LED.



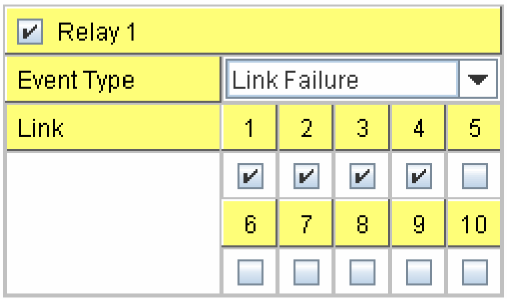
☑ Relay 1

Event Type	Power Failure
Power ID	Power 1

Event Type: **Like Failure**

Link: Select the port ID you want to monitor.

How to configure: Select the checkbox of the Ethernet ports you want to monitor. You can select one or multiple ports. When the selected ports are linked down or broken, the system will short Relay Output and light the DO LED.



☑ Relay 1

Event Type: Link Failure

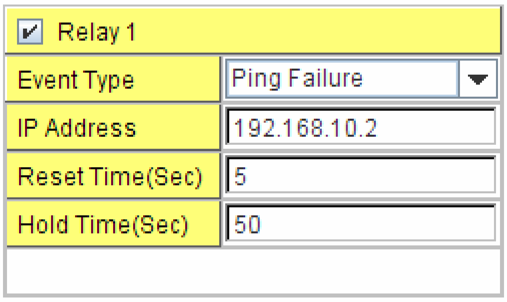
Link	1	2	3	4	5
	☑	☑	☑	☑	☐
	6	7	8	9	10
	☐	☐	☐	☐	☐

Event Type: **Ping Failure**

IP Address: IP address of the target device you want to ping.

Reset Time (Sec): Waiting time to short the relay output.

Hold Time (Sec): Waiting time to ping the target device for the duration of remote device boot



☑ Relay 1

Event Type	Ping Failure
IP Address	192.168.10.2
Reset Time(Sec)	5
Hold Time(Sec)	50

How to configure: After selecting Ping Failure event type, the system will turn Relay Output to short state and continuously ping the target device. When the ping failure occurred, the switch will turn the Relay Output to open state for a period of Reset Time.

After the Reset Time timeout, the system will turn the Relay Output to close state. After the

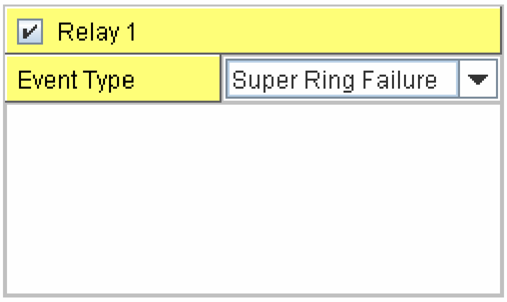
Hold Time timer is timeout, the switch system will start ping the target device.

Ex: Reset Time is 5 sec, Hold Time is 50 sec.

If the ping failure occurred, the switch system will turn Relay output to open state to emulate power switch off for 5 sec periods. After Reset Time timeout, the Switch system will start ping target device after 50 sec periods. The period time is for target device system booting. During the period, the switch system will not ping target device until Hold Time is timeout.

Event Type: **Super Ring Failure**

Select Super Ring Failure. When the Rapid Super Ring topology is changed, the system will short Relay Out and lengthen DO LED.



☑ Relay 1

Event Type: Super Ring Failure

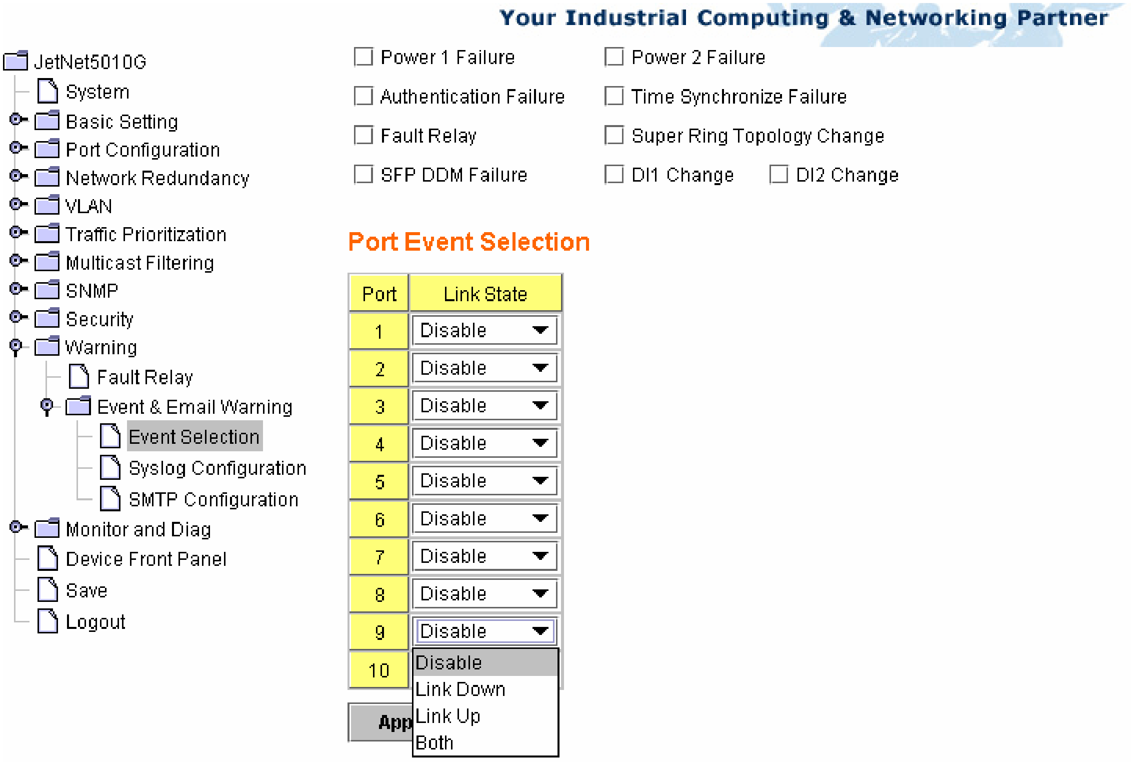
Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.11.2 Event Selection

Event Types can be divided into two basic groups: System Events and Port Events. System Events are related to the overall function of the switch, whereas Port Events related to the activity of a specific ports

System Event	**Warning Event is sent when…..**
Device Cold Start	Power is cut off and then reconnected.
Device Warm Start	Reboot the device by CLI or Web UI.
Power 1 Failure	Power 1 is failure.
Power 2 Failure	Power 2 is failure.
Authentication failure	An incorrect password, SNMP Community String is entered**.**
Time Synchronize Failure	Accessing to NTP Server is failure.
Fault Relay	The DO/Fault Relay is on.
Super Ring Topology Changes	Master of Super Ring has changed or backup path is activated.
DI1 Change	The Digital Input#1 status is changed.
DI2 Change	The Digital Input#2 status is changed.

SFP DDM Failure	The readed information of DDM SFP transceiver is over temperature or out the range of TX/RX power.
Port Event	**Warning Event is sent when…..**
Link-Up	The port is connected to another device
Link-Down	The port is disconnected (e.g. the cable is pulled out, or the opposing devices turns down)
Both	The link status changed.



□ Power 1 Failure □ Power 2 Failure
□ Authentication Failure □ Time Synchronize Failure
□ Fault Relay □ Super Ring Topology Change
□ SFP DDM Failure □ DI1 Change □ DI2 Change

Port Event Selection

Port	Link State
1	Disable
2	Disable
3	Disable
4	Disable
5	Disable
6	Disable
7	Disable
8	Disable
9	Disable
10	

Once you finish configuring the settings, click on **Apply** to apply your configuration.

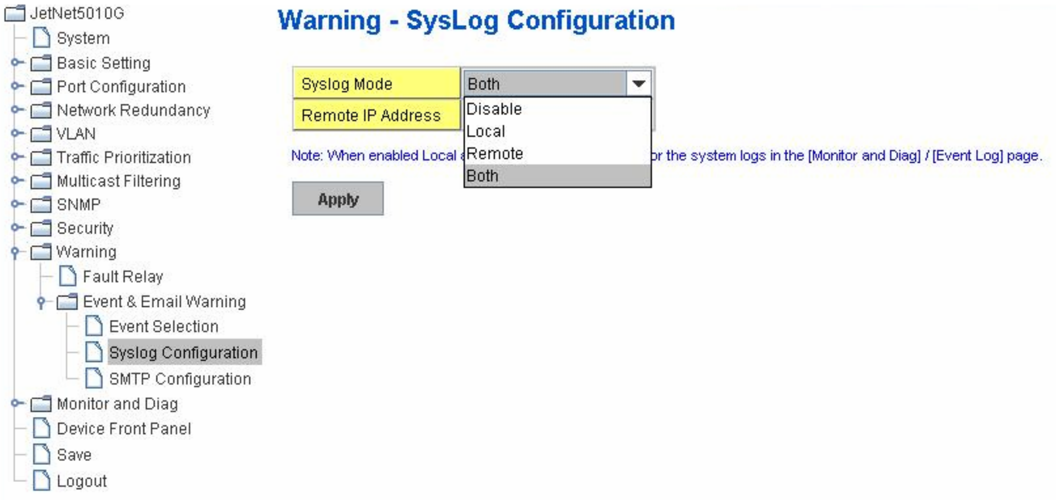
4.11.3 SysLog Configuration

System Log is useful to provide system administrator locally or remotely monitor switch events history. There are 2 System Log modes provided by JetNet 5010G, local mode and remote mode.

Local Mode: In this mode, JetNet 5010G will print the occurred events selected in the Event Selection page to System Log table of JetNet 5010G. You can monitor the system logs in [Monitor and Diag] / [Event Log] page.

Remote Mode: The remote mode is also known as Server mode in JetNet 4500 series. In this mode, you should assign the IP address of the System Log server. JetNet 5010G will send the occurred events selected in Event Selection page to System Log server you assigned.

Both: Above 2 modes can be enabled at the same time.



Warning - SysLog Configuration

Syslog Mode: Both

Remote IP Address

Note: When enabled Local a r the system logs in the [Monitor and Diag] / [Event Log] page.

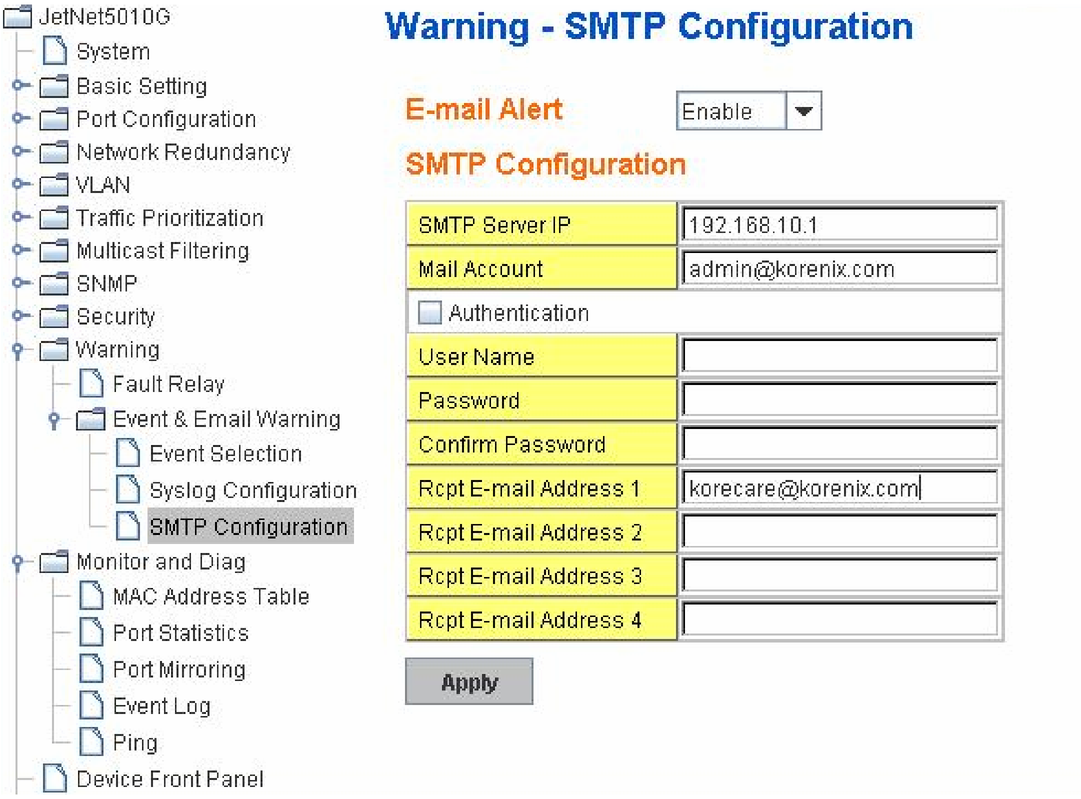
Once you finish configuring the settings, click on **Apply** to apply your configuration.

Note: *When enabling Local or Both mode, you can monitor the system logs in [Monitor and Diag] / [Event Log] page.*

4.11.4 SMTP Configuration

JetNet 5010G supports E-mail Warning feature. The switch will send the occurred events to remote E-mail server. The receiver can then receive notification by E-mail. The E-mail warning is conformed to SMTP standard.

This page allows you to enable E-mail Alert, assign the SMTP Server IP, Sender E-mail, and Receiver E-mail. If SMTP server requests you to authorize first, you can also set up the username and password in this page.



Warning - SMTP Configuration

E-mail Alert: Enable

SMTP Configuration

SMTP Server IP	192.168.10.1
Mail Account	admin@korenix.com
□ Authentication	
User Name	
Password	
Confirm Password	
Rcpt E-mail Address 1	korecare@korenix.com
Rcpt E-mail Address 2	
Rcpt E-mail Address 3	
Rcpt E-mail Address 4	

Field	Description
SMTP Server IP Address	Enter the IP address of the email Server
Authentication	Click on check box to enable password
User Name	Enter email Account name (Max.40 characters)
Password	Enter the password of the email account
Confirm Password	Re-type the password of the email account
You can set up to 4 email addresses to receive email alarm from JetNet	
Rcpt E-mail Address 1	The first email address to receive email alert from JetNet (Max. 40 characters)
Rcpt E-mail Address 2	The second email address to receive email alert from JetNet (Max. 40 characters)
Rcpt E-mail Address 3	The third email address to receive email alert from JetNet (Max. 40 characters)
Rcpt E-mail Address 4	The fourth email address to receive email alert from JetNet (Max. 40 characters)

Once you finish configuring the settings, click on **Apply** to apply your configuration.

4.11.5 CLI Commands

Command Lines of the Warning configuration

Feature	Command Line
Relay Output	
Relay Output	Switch(config)# relay 1 di DI state dry dry output ping ping failure port port link failure power power failure ring super ring failure ***Note: Select Relay 1 or 2 first, then select the event types.***
DI State	Switch(config)# relay 1 di <1-2> DI number Switch(config)# relay 1 di 1 high high is abnormal low low is abnormal Switch(config)# relay 1 di 1 high
Dry Output	Switch(config)# relay 1 dry <0-4294967295> turn on period in second Switch(config)# relay 1 dry 5 <0-4294967295> turn off period in second Switch(config)# relay 1 dry 5 5
Ping Failure	Switch(config)# relay 1 ping 192.168.10.33 <cr> reset reset a device Switch(config)# relay 1 ping 192.168.10.33 reset <1-65535> reset time Switch(config)# relay 1 ping 192.168.10.33 reset 60 <0-65535> hold time to retry Switch(config)# relay 1 ping 192.168.10.33 reset 60 60
Port Link Failure	Switch(config)# relay 1 port PORTLIST port list Switch(config)# relay 1 port fa1-5
Power Failure	Switch(config)# relay 1 power <1-2> power id Switch(config)# relay 1 power 1 Switch(config)# relay 1 power 2
Super Ring Failure	Switch(config)# relay 1 ring
Disable Relay	Switch(config)# no relay <1-2> relay id Switch(config)# no relay 1 *(Relay_ID: 1 or 2)* <cr>
Display	Switch# show relay 1 Relay Output Type : Port Link Port : 1, 2, 3, 4, Switch# show relay 2 Relay Output Type : Super Ring
Event Selection	
Event Selection	Switch(config)# warning-event coldstart Switch cold start event warmstart Switch warm start event linkdown Switch link down event linkup Switch link up event

	all Switch all event authentication Authentication failure event di Switch di event fault-relay Switch fault relay event power Switch power failure event sfp-ddm Switch SFP DDM abnormal event super-ring Switch super ring topology change event time-sync Switch time synchronize event
Ex: Cold Start event	Switch(config)# warning-event coldstart Set cold start event enable ok.
Ex: Link Up event	Switch(config)# warning-event linkup [IFNAME] Interface name, ex: fastethernet1 or gi8 Switch(config)# warning-event linkup fa5 Set fa5 link up event enable ok.
Display	Switch# show warning-event Warning Event: Cold Start: Enabled Warm Start: Disabled Authentication Failure: Disabled Link Down: fa4-5 Link Up: fa4-5 Power Failure: Super Ring Topology Change: Disabled Fault Relay: Disabled Time synchronize Failure: Disable SFP DDM: Enabled DI:DI1
Syslog Configuration	
Local Mode	Switch(config)# log syslog local
Server Mode	Switch(config)# log syslog remote 192.168.10.33
Both	Switch(config)# log syslog local Switch(config)# log syslog remote 192.168.10.33
Disable	Switch(config)# no log syslog local
SMTP Configuration	
SMTP Enable	Switch(config)# smtp-server enable email-alert SMTP Email Alert set enable ok.
Sender mail	Switch(config)# smtp-server server 192.168.10.100 ACCOUNT SMTP server mail account, ex: admin@korenix.com Switch(config)# smtp-server server 192.168.10.100 admin@korenix.com SMTP Email Alert set Server: 192.168.10.100, Account: admin@korenix.com ok.
Receiver mail	Switch(config)# smtp-server receipt 1 korecare@korenix.com SMTP Email Alert set receipt 1: korecare@korenix.com ok.
Authentication with username and password	Switch(config)# smtp-server authentication username admin password admin SMTP Email Alert set authentication Username: admin, Password: admin ***Note: You can assign string to username and password.***
Disable SMTP	Switch(config)# no smtp-server enable email-alert SMTP Email Alert set disable ok.
Disable Authentication	Switch(config)# no smtp-server authentication SMTP Email Alert set Authentication disable ok.
Dispaly	Switch# sh smtp-server SMTP Email Alert is Enabled

	Server: 192.168.10.100, Account: admin@korenix.com Authentication: Enabled Username: admin, Password: admin SMTP Email Alert Receipt: Receipt 1: korecare@korenix.com Receipt 2: Receipt 3: Receipt 4:

4.12 Monitor and Diag

JetNet 5010G provides several types of features for you to monitor the status of the switch or diagnostic for you to check the problem when encountering problems related to the switch. The features include MAC Address Table, Port Statistics, Port Mirror, Event Log and Ping.

Following commands are included in this group:

4.11.1 MAC Address Table

4.11.2 Port Statistics

4.11.3 Port Mirror

4.11.4 Event Log

4.11.5 Topology Discovery

4.11.5 Ping

4.11.6 CLI Commands of the Monitor and Diag

4.12.1 MAC Address Table

JetNet 5010G provides 8K entries in MAC Address Table. In this page, users can change the Aging time, add Static Unicast MAC Address, monitor the MAC address or sort them by different packet types and ports. Click on **Apply** to change the value.

Aging Time (Sec)

Each switch fabric has limit size to write the learnt MAC address. To save more entries for new MAC address, the switch fabric will age out non-used MAC address entry per Aging Time timeout. The default Aging Time is 300 seconds. The Aging Time can be modified in this page.

Static Unicast MAC Address

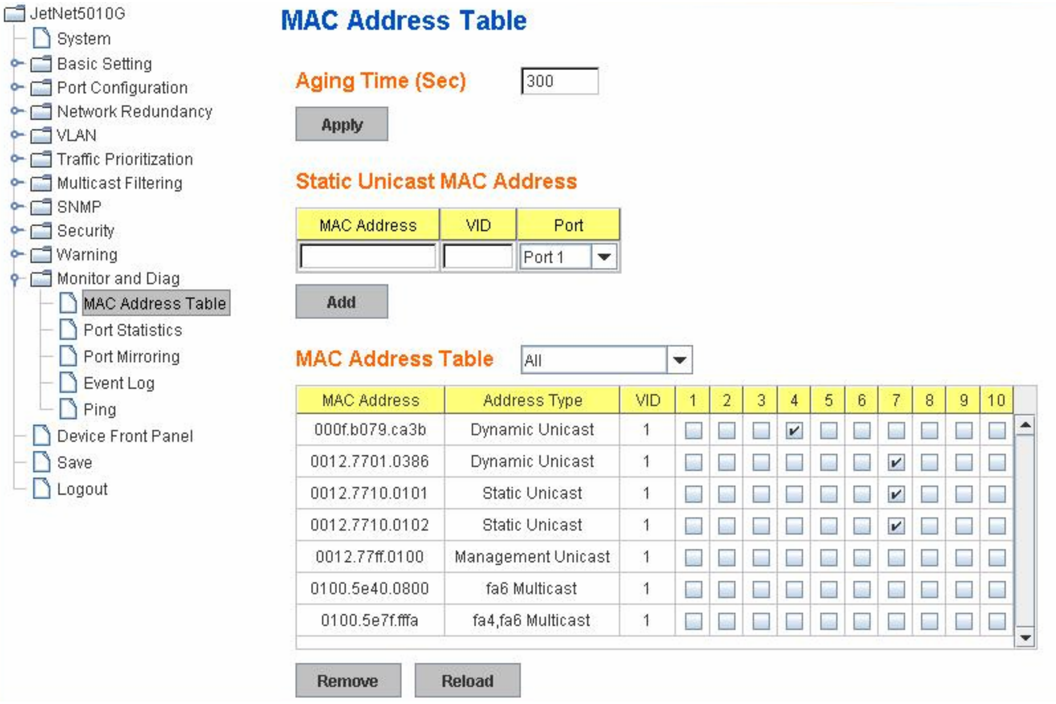
In some applications, users may need to type in the static Unicast MAC address to its MAC address table. In this page, you can type MAC Address (format: xxxx.xxxx.xxxx), select its VID and Port ID, and then click on **Add** to add it to MAC Address table.

MAC Address Table

In this MAC Address Table, you can see all the MAC Addresses learnt by the switch fabric. The packet types include Management Unicast, Static Unicast, Dynamic Unicast, Static Multicast and Dynamic Multicast. The table allows users to sort the address by the packet types and port.

Packet Types: Management Unicast means MAC address of the switch. It belongs to CPU port only. **Static Unicast** MAC address can be added and deleted. **Dynamic Unicast** MAC is MAC address learnt by the switch Fabric. **Static Multicast** can be added by CLI and can be deleted by Web and CLI. **Dynamic Multicast** will appear after you enabled IGMP and the switch learnt IGMP report.

Click on **Remove** to remove the static Unicast/Multicast MAC address. Click on **Reload** to refresh the table. New learnt Unicast/Multicast MAC address will be updated to MAC address table.



MAC Address Table

Aging Time (Sec) 300

Apply

Static Unicast MAC Address

MAC Address	VID	Port
		Port 1

Add

MAC Address Table All

MAC Address	Address Type	VID	1	2	3	4	5	6	7	8	9	10
000f.b079.ca3b	Dynamic Unicast	1	□	□	□	☑	□	□	□	□	□	□
0012.7701.0386	Dynamic Unicast	1	□	□	□	□	□	□	☑	□	□	□
0012.7710.0101	Static Unicast	1	□	□	□	□	□	□	☑	□	□	□
0012.7710.0102	Static Unicast	1	□	□	□	□	□	□	☑	□	□	□
0012.77ff.0100	Management Unicast	1	□	□	□	□	□	□	□	□	□	□
0100.5e40.0800	fa6 Multicast	1	□	□	□	□	□	□	□	□	□	□
0100.5e7f.fffa	fa4,fa6 Multicast	1	□	□	□	□	□	□	□	□	□	□

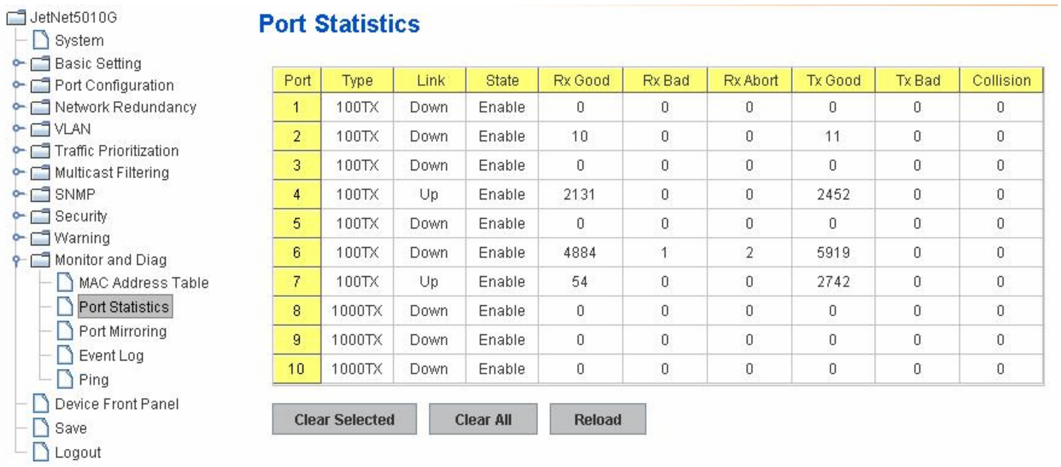
Remove Reload

4.12.2 Port Statistics

In this page, you can view operation statistics for each port. The statistics that can be viewed include Link Type, Link State, Rx Good, Rx Bad, Rx Abort, Tx Good, Tx Bad and Collision. Rx means the received packet while Tx means the transmitted packets.

Note: If you see many Bad, Abort or Collision counts increased, that may mean your network cable is not connected well, the network performance of the port is poor…etc. Please check your network cable, Network Interface Card of the connected device, the network application, or reallocate the network traffic…etc.

Click on **Clear Selected** to reinitialize the counts of the selected ports, and **Clear All** to reinitialize the counts of all ports. Click on **Reload** to refresh the counts.



Port Statistics

Port	Type	Link	State	Rx Good	Rx Bad	Rx Abort	Tx Good	Tx Bad	Collision
1	100TX	Down	Enable	0	0	0	0	0	0
2	100TX	Down	Enable	10	0	0	11	0	0
3	100TX	Down	Enable	0	0	0	0	0	0
4	100TX	Up	Enable	2131	0	0	2452	0	0
5	100TX	Down	Enable	0	0	0	0	0	0
6	100TX	Down	Enable	4884	1	2	5919	0	0
7	100TX	Up	Enable	54	0	0	2742	0	0
8	1000TX	Down	Enable	0	0	0	0	0	0
9	1000TX	Down	Enable	0	0	0	0	0	0
10	1000TX	Down	Enable	0	0	0	0	0	0

Clear Selected Clear All Reload

4.12.3 Port Mirroring

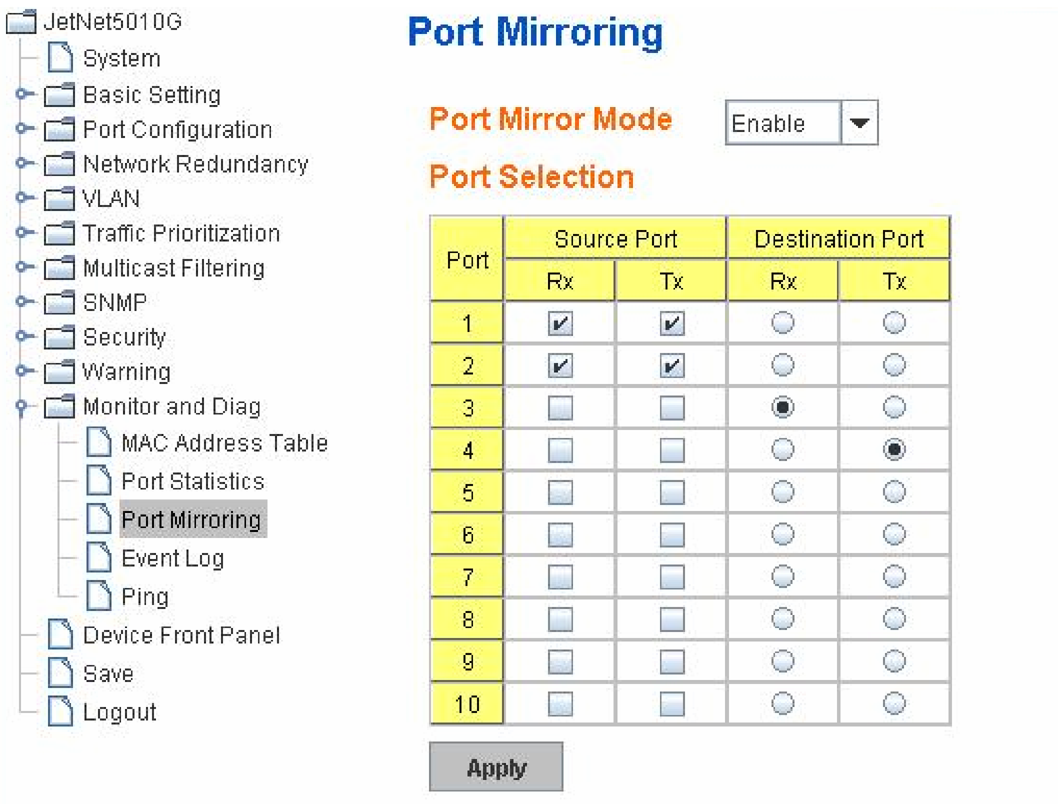
Port mirroring (also called port spanning) is a tool that allows you to mirror the traffic from one or more ports onto another port, without disrupting the flow of traffic on the original port. Any traffic that goes into or out of the Source Port(s) will be duplicated at the Destination Port. This traffic can then be analyzed at the Destination port using a monitoring device or application. A network administrator will typically utilize this tool for diagnostics, debugging, or fending off attacks.

Port Mirror Mode: Select Enable/Disable to enable/disable Port Mirror.

Source Port: This is also known as Monitor Port. These are the ports you want to monitor. The traffic of all source/monitor ports will be copied to destination/analysis ports. You can choose a single port, or any combination of ports, but you can only monitor them in Rx or TX only. Click on checkbox of the Port ID, RX, Tx or Both to select the source ports.

Destination Port: This is also known as Analysis Port. You can analyze the traffic of all the monitored ports at this port without affecting the flow of traffic on the port(s) being monitored. Only one RX/TX of the destination port can be selected. A network administrator would typically connect a LAN analyzer or Netxray device to this port.

Once you finish configuring the settings, click on **Apply** to apply the settings.



Port Mirroring

Port Mirror Mode: Enable

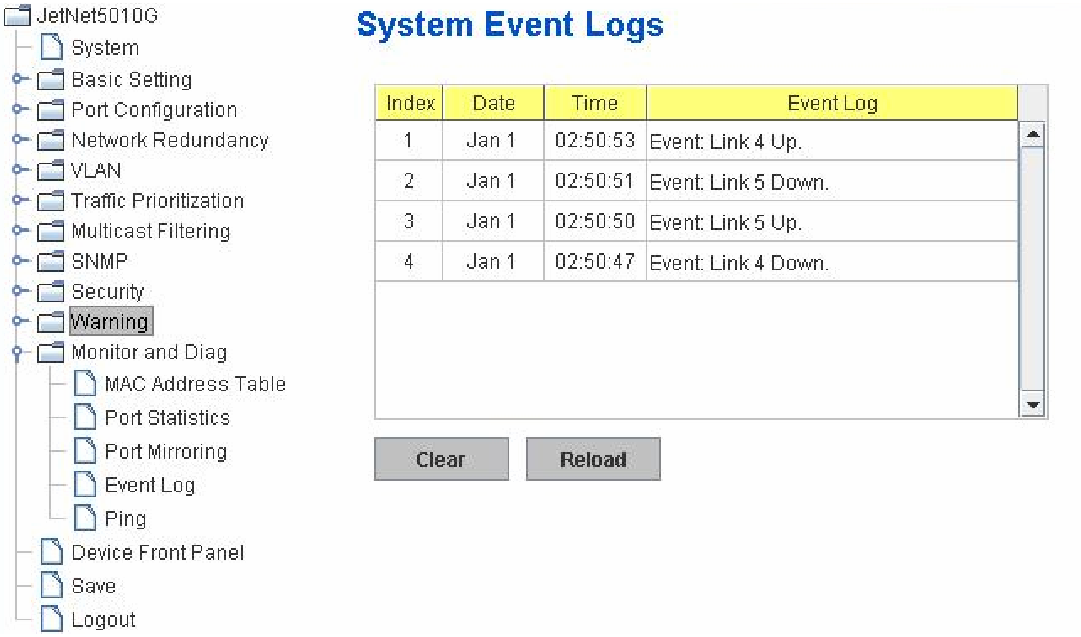
Port Selection

Port	Source Port		Destination Port	
	Rx	Tx	Rx	Tx
1	☑	☑	○	○
2	☑	☑	○	○
3	□	□	●	○
4	□	□	○	●
5	□	□	○	○
6	□	□	○	○
7	□	□	○	○
8	□	□	○	○
9	□	□	○	○
10	□	□	○	○

4.12.4 Event Log

In the 4.10.3, we have introduced System Log feature. When System Log Local mode is selected, JetNet 5010G will record occurred events in local log table. This page shows this log table. The entry includes the index, occurred data and time and content of the events.

Click on **Clear** to clear the entries. Click on **Reload** to refresh the table.



System Event Logs

Index	Date	Time	Event Log
1	Jan 1	02:50:53	Event: Link 4 Up.
2	Jan 1	02:50:51	Event: Link 5 Down.
3	Jan 1	02:50:50	Event: Link 5 Up.
4	Jan 1	02:50:47	Event: Link 4 Down.

4.12.5 Topology Discovery

JetNet 4510 supports topology discovery or LLDP (IEEE 802.1AB Link Layer Discovery Protocol) function that can help user to discovery multi-vendor's network devicec on same segment by NMS system which supports LLDP function; With LLDP function, NMS can easier maintain the topology map, display port ID, port description, system description, VLAN ID… Once the link failure, the topology change events can be updated to the NMS as well. The LLDP Port State can display the neighbor ID and IP leant from the connected devices.

LLDP: Select Enable/Disable to enable/disable LLDP function.

LLDP Configuration: To configure the related timer of LLDP.

LLDP Timer: the interval time of each LLDP and counts in second; the valid number is from 5 to 254, default is 30 seconds.

LLDP Hold time: The TTL (Time To Live) timer. The LLDP state will be expired once the LLDP is not received by the hold time. The default is 120 seconds.

Local port: the current port number that linked with neighbor network device.

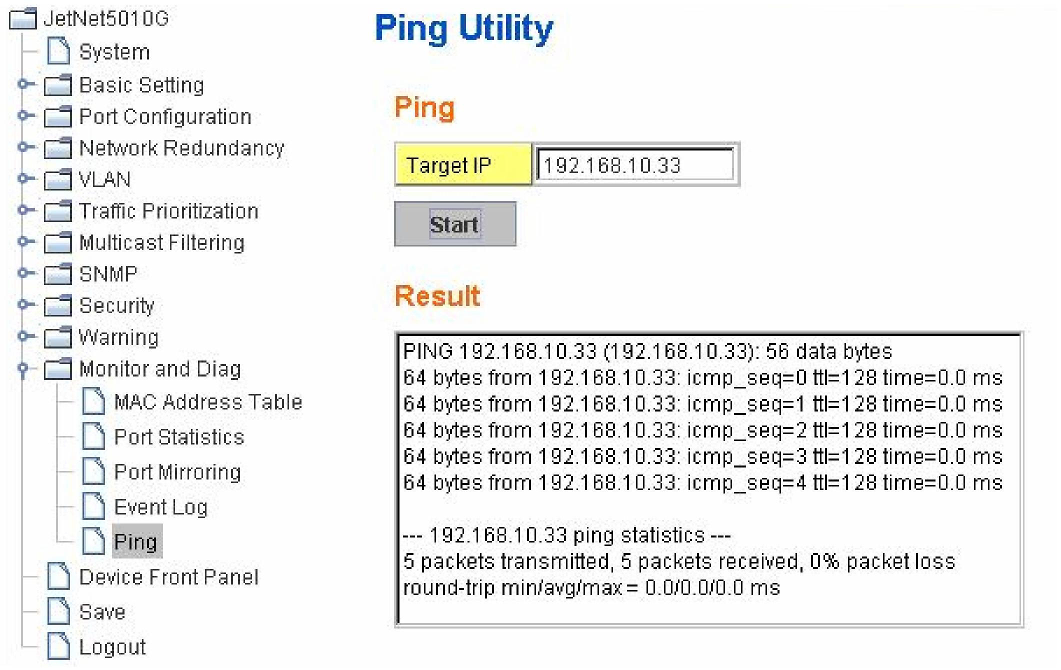
Neighbor ID: the MAC address of neighbor device on the same network segment.

Neighbor IP: the IP address of neighbor device on the same network segment.

Neighbor VID: the VLAN ID of neightbor device on the same network segment.

4.12.6 Ping Utility

This page provides **Ping Utility** for users to ping remote device and check whether the device is alive or not. Type **Target IP** address of the target device and click on **Start** to start the ping. After few seconds, you can see the result in the **Result** field.



Ping Utility

Ping

Target IP: 192.168.10.33

Result

```
PING 192.168.10.33 (192.168.10.33): 56 data bytes
64 bytes from 192.168.10.33: icmp_seq=0 ttl=128 time=0.0 ms
64 bytes from 192.168.10.33: icmp_seq=1 ttl=128 time=0.0 ms
64 bytes from 192.168.10.33: icmp_seq=2 ttl=128 time=0.0 ms
64 bytes from 192.168.10.33: icmp_seq=3 ttl=128 time=0.0 ms
64 bytes from 192.168.10.33: icmp_seq=4 ttl=128 time=0.0 ms

--- 192.168.10.33 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.0/0.0/0.0 ms
```

4.12.7 CLI Commands of the Monitor and Diag

Command Lines of the Monitor and Diag configuration

Feature	Command Line
MAC Address Table	
Ageing Time	Switch(config)# mac-address-table aging-time 350 mac-address-table aging-time set ok! *Note: 350 is the new ageing timeout value.*
Add Static Unicast MAC address	Switch(config)# mac-address-table static 0012.7701.0101 vlan 1 interface fastethernet7 mac-address-table ucast static set ok! ***Note: rule: mac-address-table static MAC_address VLAN VID interface interface_name***
Add Multicast MAC address	Switch(config)# mac-address-table multicast 0100.5e01.0101 vlan 1 interface fa6-7 Adds an entry in the multicast table ok! ***Note: rule: mac-address-table multicast MAC_address VLAN VID interface_list interface_name/range***
Show MAC Address Table – All types	Switch# show mac-address-table ***** UNICAST MAC ADDRESS ***** Destination Address Address Type Vlan Destination Port ------------------- --------------- ------- ------------------------

	000f.b079.ca3b Dynamic 1 fa4 0012.7701.0386 Dynamic 1 fa7 0012.7710.0101 Static 1 fa7 0012.7710.0102 Static 1 fa7 0012.77ff.0100 Management 1 ***** MULTICAST MAC ADDRESS ***** Vlan Mac Address COS Status Ports ---- --------------- ---- ------- -------------------------- 1 0100.5e40.0800 0 fa6 1 0100.5e7f.fffa 0 fa4,fa6
Show MAC Address Table – Dynamic Learnt MAC addresses	Switch# show mac-address-table dynamic Destination Address Address Type Vlan Destination Port ------------------- --------------- ------- ------------------------ 000f.b079.ca3b Dynamic 1 fa4 0012.7701.0386 Dynamic 1 fa7
Show MAC Address Table – Multicast MAC addresses	Switch# show mac-address-table multicast Vlan Mac Address COS Status Ports ---- --------------- ---- ------- -------------------------- 1 0100.5e40.0800 0 fa6-7 1 0100.5e7f.fffa 0 fa4,fa6-7
Show MAC Address Table – Static MAC addresses	Switch# show mac-address-table static Destination Address Address Type Vlan Destination Port ------------------- --------------- ------- ------------------------ 0012.7710.0101 Static 1 fa7 0012.7710.0102 Static 1 fa7
Show Aging timeout time	Switch# show mac-address-table aging-time the mac-address-table aging-time is 300 sec.
Port Statistics	

Port Statistics	Switch# show rmon statistics fa4 (select interface)
	Interface fastethernet4 is enable connected, which has
	  Inbound:
	    Good Octets: 178792, Bad Octets: 0
	    Unicast: 598, Broadcast: 1764, Multicast: 160
	    Pause: 0, Undersize: 0, Fragments: 0
	    Oversize: 0, Jabbers: 0, Disacrds: 0
	    Filtered: 0, RxError: 0, FCSError: 0
	  Outbound:
	    Good Octets: 330500
	    Unicast: 602, Broadcast: 1, Multicast: 2261
	    Pause: 0, Deferred: 0, Collisions: 0
	    SingleCollision: 0, MultipleCollision: 0
	    ExcessiveCollision: 0, LateCollision: 0
	    Filtered: 0, FCSError: 0
	Number of frames received and transmitted with a length of:
	    64: 2388, 65to127: 142, 128to255: 11
	    256to511: 64, 512to1023: 10, 1024toMaxSize: 42

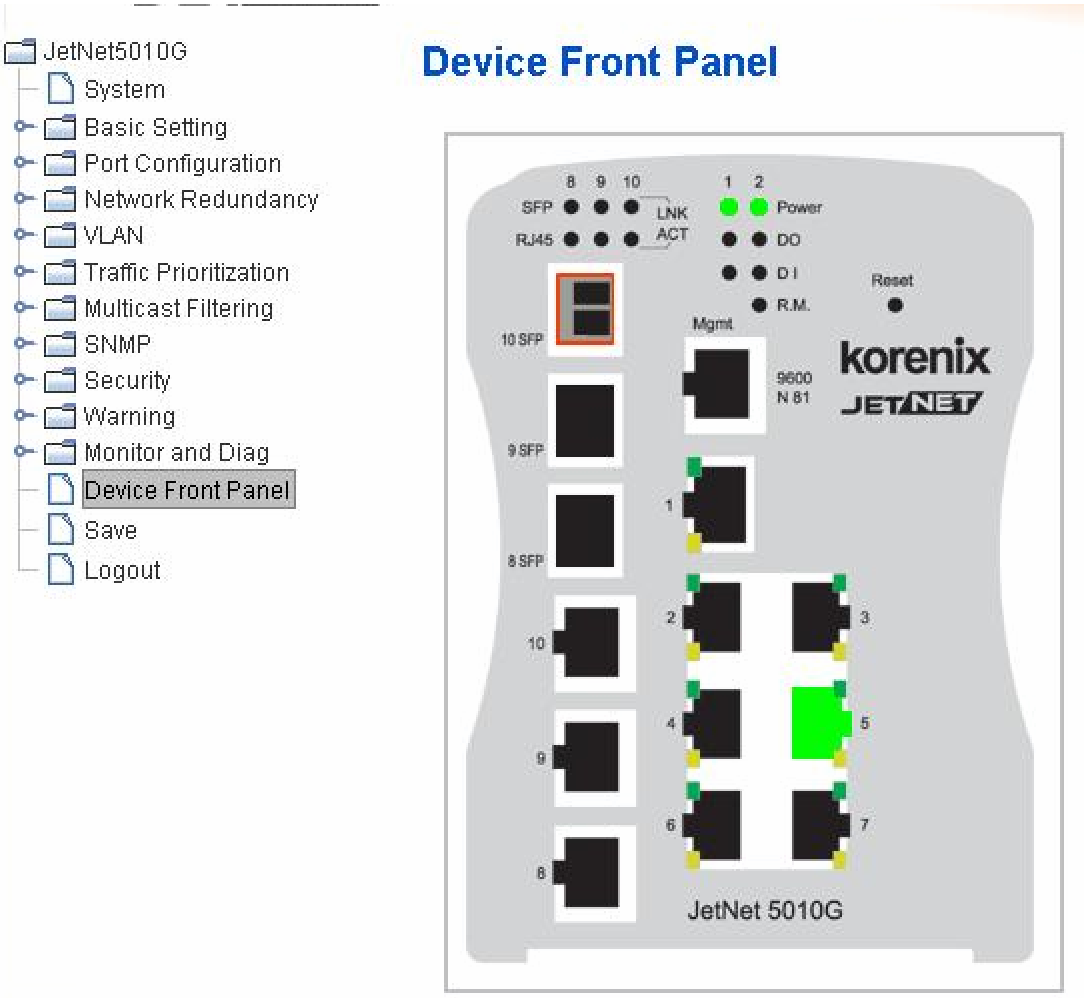
Port Mirroring	
Enable Port Mirror	Switch(config)# mirror en Mirror set enable ok.
Disable Port Mirror	Switch(config)# mirror disable Mirror set disable ok.
Select Source Port	Switch(config)# mirror source fa1-2 both Received and transmitted traffic rx Received traffic tx Transmitted traffic Switch(config)# mirror source fa1-2 both

	Mirror source fa1-2 both set ok. ***Note: Select source port list and TX/RX/Both mode.***
Select Destination Port	Switch(config)# mirror destination fa6 both Mirror destination fa6 both set ok
Display	Switch# show mirror Mirror Status : Enabled Ingress Monitor Destination Port : fa6 Egress Monitor Destination Port : fa6 Ingress Source Ports :fa1,fa2, Egress Source Ports :fa1,fa2,
Event Log	
Display	Switch# show event-log <1>Jan 1 02:50:47 snmpd[101]: Event: Link 4 Down. <2>Jan 1 02:50:50 snmpd[101]: Event: Link 5 Up. <3>Jan 1 02:50:51 snmpd[101]: Event: Link 5 Down. <4>Jan 1 02:50:53 snmpd[101]: Event: Link 4 Up.
Ping	
Ping IP	Switch# ping 192.168.10.33 PING 192.168.10.33 (192.168.10.33): 56 data bytes 64 bytes from 192.168.10.33: icmp_seq=0 ttl=128 time=0.0 ms 64 bytes from 192.168.10.33: icmp_seq=1 ttl=128 time=0.0 ms 64 bytes from 192.168.10.33: icmp_seq=2 ttl=128 time=0.0 ms 64 bytes from 192.168.10.33: icmp_seq=3 ttl=128 time=0.0 ms 64 bytes from 192.168.10.33: icmp_seq=4 ttl=128 time=0.0 ms --- 192.168.10.33 ping statistics --- 5 packets transmitted, 5 packets received, 0% packet loss round-trip min/avg/max = 0.0/0.0/0.0 ms

4.12 Device Front Panel

Device Front Panel command allows you to see LED status of the switch. You can see LED and link status of the Power, DO, DI, R.M. and Ports.

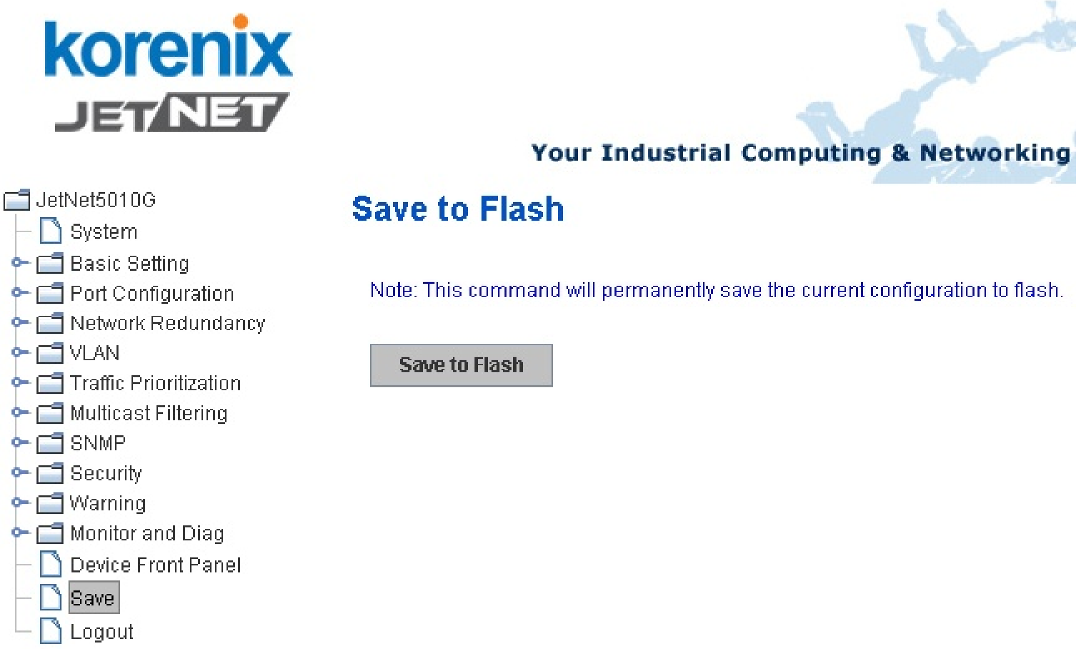
Feature	On / Link UP	Off / Link Down	Other
Power	Green	Black	
Digital Output	Green	Black	
Digital Input	Green	Black	
R.M.(Ring Master)	Green	Black	
Fast Ethernet	Green	Black	
Gigabit Ethernet	Green	Black	
SFP	Green	Black	Gray: Plugged but not link up yet.



Note: No CLI command for this feature.

4.13 Save to Flash

Save Configuration allows you to save any configuration you just made to the Flash. Powering off the switch without clicking on **Save Configuration** will cause loss of new settings. After selecting **Save Configuration**, click on **Save to Flash** to save your new configuration.



Save to Flash

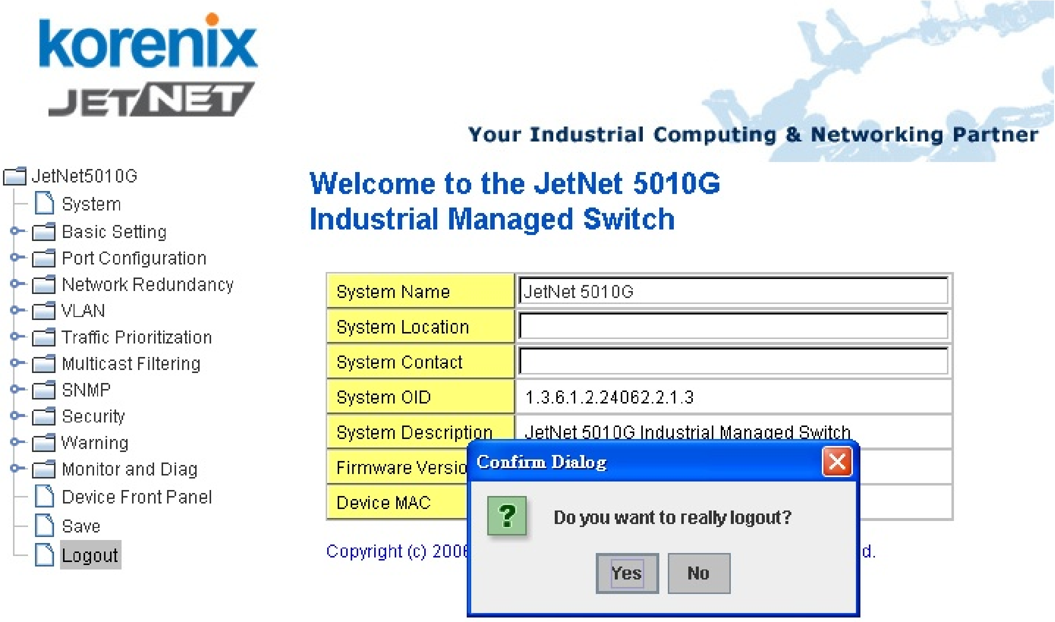
Note: This command will permanently save the current configuration to flash.

Command Lines:

Feature	Command Line
Save	SWITCH# write Building Configuration… [OK] Switch# copy running-config startup-config Building Configuration... [OK]

4.14 Logout

The switch provides 2 logout methods. The web connection will be logged out if you don't input any command after 30 seconds. The Logout command allows you to manually logout the web connection. Click on **Yes** to logout, **No** to go back the configuration page.



System Name	JetNet 5010G
System Location	
System Contact	
System OID	1.3.6.1.2.24062.2.1.3
System Description	JetNet 5010G Industrial Managed Switch
Firmware Versio	
Device MAC	

Do you want to really logout?

Command Lines:

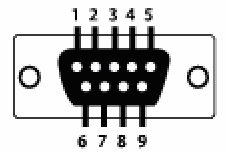
Feature	Command Line
Logout	SWITCH> exit SWITCH# exit

5. Appendix

5.1 Pin Assignment of the RS-232 Console Cable

The total cable length is 150cm, excluding RJ-45 and DB-9!

DB-9 is 'Female.'



RJ-45 Pin	DB-9 Pin
1	7
2	9
3	4
4	5
5	1
6	3
7	2
8	8

RJ-45 Pin-3: TxD, Pin-6: RxD, Pin-5:GND

5.2 Korenix SFP family

Korenix certificated many types of SFP transceiver. These certificated SFP transceivers can be identified by JetNet 5010G and displayed in the UI. The SFP transceivers we certificated can meet up the industrial critical environment needs. We recommend you to use Korenix certificated SFP transceivers when you constructing your network.

Korenix will keep on certificating and updating the certificated SFP transceivers in Korenix web site and purchase list. You can refer to the web site to get the latest information about SFP transceivers.

Note: Poor SFP transceivers may result in poor network performance or can't meet up claimed distance or temperature.

Model Name	**Gigabit SFP Transceiver**
SFPGSX	1000Base-SX multi-mode SFP transceiver,550m, -10~70℃
SFPGSX-w	1000Base-SX multi-mode SFP transceiver,550m, wide operating temperature, -40~85℃
SFPGSX2	1000Base-SX plus multi-mode SFP transceiver,2Km, -10~70℃
SFPGSX2-w	1000Base-SX plus multi-mode SFP transceiver, 2Km,wide operating temperature, -10~70℃
SFPGLX10	1000Base-LX single-mode SFP transceiver 10Km, -10~70℃
SFPGLX10-w	1000Base-LX single-mode SFP transceiver, 10Km, wide operating temperature, -40~85℃
SFPGLHX30	1000Base-LHX single-mode SFP transceiver,30Km, -10~70℃
SFPGLHX30-w	1000Base-LHX single-mode SFP transceiver, 30Km, wide operating temperature, -40~85℃
SFPGXD50	1000Base-XD single-mode SFP transceiver, 50Km, -10~70℃
SFPGXD50-w	1000Base-XD single-mode SFP transceiver, 50Km, wide operating temperature, -40~85℃
SFPGZX70	1000Base-ZX single-mode SFP transceiver, 70Km, -10~70℃
SFPGZX70-w	1000Base-ZX single-mode SFP transceiver, 70Km, -40℃ - 85℃

Model Name	**Gigabit BIDI/WDM SFP Transceiver**
SFPGLX10B13	1000Base-LX, single-mode, TX 1310nm/ RX 1550nm,10Km, -10~70℃
SFPGLX10B13-w	1000Base-LX single-mode, TX 1310nm/ RX 1550nm,10Km, -40℃ - 85℃
SFPGLX10B15	1000Base-LX, single-mode, TX 1550nm/ RX 1310nm,10Km, -10~70℃
SFPGLX10B15-w	1000Base-LX single-mode, TX 1550nm/ RX 1310nm,10Km, -40℃ - 85℃
SFPGLX20B13	1000Base-LX, single-mode, TX 1310nm/ RX 1550nm,10Km, -10~70℃
SFPGLX20B13-w	1000Base-LX single-mode, TX 1310nm/ RX 1550nm, 10Km, -40℃ - 85℃
SFPGLX20B15	1000Base-LX, single-mode, TX 1550nm/ RX 1310nm, 20Km, -10~70℃
SFPGLX20B15-w	1000Base-LX single-mode, TX 1550nm/ RX 1310nm, 20Km, -40℃ - 85℃
SFPGLX40B13	1000Base-LX, single-mode, TX 1310nm/ RX 1550nm,40Km, -10~70℃
SFPGLX40B13-w	1000Base-LX single-mode, TX 1310nm/ RX 1550nm, 40Km, -40℃ - 85℃

SFPGLX40B15	1000Base-LX, single-mode, TX 1550nm/ RX 1310nm, 40Km, -10~70℃
SFPGLX40B15-w	1000Base-LX single-mode, TX 1550nm/ RX 1310nm, 40Km, -40℃ - 85℃
SFPGLX60B13	1000Base-LX, single-mode, TX 1310nm/ RX 1550nm,60Km, -10~70℃
SFPGLX60B15	1000Base-LX, single-mode, TX 1550nm/ RX 1310nm, 60Km, -10~70℃

Model Name	**100Mbps SFP Transceiver**
SFP100MM	Multi-mode 100Mbps 2KM Fiber Transceiver, -10~70℃.
SFP100MM-w	Multi-mode 100Mbps 2KM Fiber Transceiver, wide operating temperature -40~85℃.
SFP100SM30	Single mode 100Mbps 30KM Fiber Transceiver -10~70℃.
SFP100SM30-w	Single mode 100Mbps 30Km Fiber Transceiver, wide operating temperature. -40~85℃
SFP100SM60	Single mode 100Mbps 60KM Fiber Transceiver -10~70℃.
SFP100SM60-w	Single mode 100Mbps 60Km Fiber Transceiver, wide operating temperature. -40~85℃
SFP100SM80	Single mode 100Mbps 80KM Fiber Transceiver -10~70℃.
SFP100SM80-w	Single mode 100Mbps 80Km Fiber Transceiver, wide operating temperature. -40~85℃
SFP100SM100	Single mode 100Mbps 100KM Fiber Transceiver -10~70℃.
SFP100SM100-w	Single mode 100Mbps 100Km Fiber Transceiver, wide operating temperature. -40~85℃
SFP100SM120	Single mode 100Mbps 120KM Fiber Transceiver -10~70℃.
SFP100SM120-w	Single mode 100Mbps 120Km Fiber Transceiver, wide operating temperature. -40~85℃

Model Name	**100Mbps BIDI/WDM SFP Transceiver**
SFP100SM20B13	Single mode 100Mbps, TX 1310nm/RX 1550nm, 20Km Fiber Transceiver, -10~70℃
SFP100SM20B13-w	Single mode 100Mbps, TX 1310nm/RX 1550nm, 20Km Fiber Transceiver, -40~85℃
SFP100SM20B15	Single mode 100Mbps, TX 1550nm/RX 1310nm, 20Km Fiber Transceiver, -10~70℃
SFP100SM20B15-w	Single mode 100Mbps, TX 1550nm/RX 1310nm, 20Km Fiber Transceiver, -40~85℃
SFP100SM40B13	Single mode 100Mbps, TX 1310nm/RX 1550nm, 40Km Fiber Transceiver, -10~70℃
SFP100SM40B13-w	Single mode 100Mbps, TX 1310nm/RX 1550nm, 40Km Fiber Transceiver, -40~85℃
SFP100SM40B15	Single mode 100Mbps, TX 1550nm/RX 1310nm, 40Km Fiber Transceiver, -10~70℃
SFP100SM40B15-w	Single mode 100Mbps, TX 1550nm/RX 1310nm, 40Km Fiber Transceiver, -40~85℃
SFP100SM60B13	Single mode 100Mbps, TX 1310nm/RX 1550nm, 60Km Fiber Transceiver, -10~70℃
SFP100SM60B13-w	Single mode 100Mbps, TX 1310nm/RX 1550nm, 60Km Fiber Transceiver,

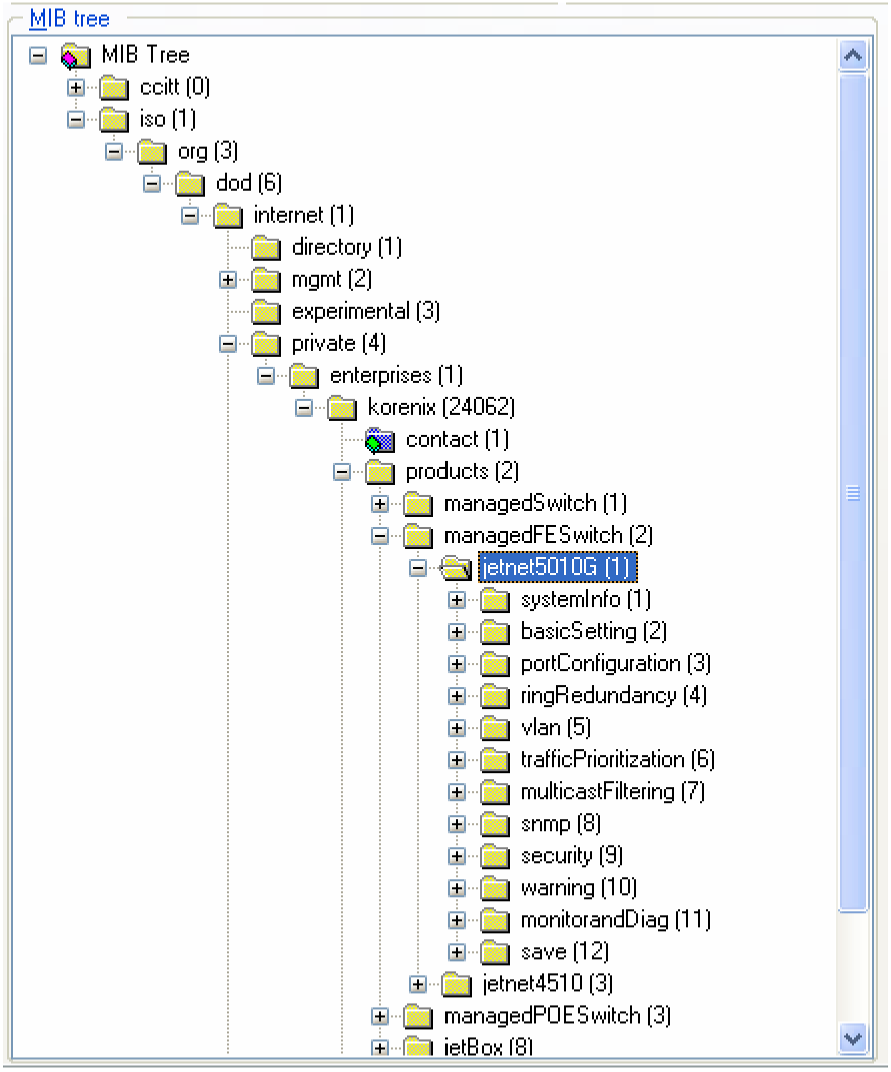
	-40~85℃
SFP100SM60B15	Single mode 100Mbps, TX 1550nm/RX 1310nm, 60Km Fiber Transceiver, -10~70℃
SFP100SM60B15-w	Single mode 100Mbps, TX 1550nm/RX 1310nm, 60Km Fiber Transceiver, -40~85℃

5.3 Korenix Private MIB

Korenix provides many standard MIBs for users to configure or monitor the switch's configuration by SNMP. But, since some commands can't be found in standard MIB, Korenix provides Private MIB to meet up the need. Compile the private MIB file by your SNMP tool. You can then use it. Private MIB can be found in product CD or downloaded from Korenix Web site.

Private MIB tree is the same as the web tree. This is easier to understand and use. If you are not familiar with standard MIB, you can directly use private MIB to manage /monitor the switch, no need to learn or find where the OIDs of the commands are.

The path of the JetNet 5010G is 1.3.6.1.4.1.24062.2.2.1 Below is the Private MIB tree for your reference.



MIB tree

- MIB Tree
  - ccitt (0)
  - iso (1)
    - org (3)
      - dod (6)
        - internet (1)
          - directory (1)
          - mgmt (2)
          - experimental (3)
          - private (4)
            - enterprises (1)
              - korenix (24062)
                - contact (1)
                - products (2)
                  - managedSwitch (1)
                  - managedFESwitch (2)
                    - jetnet5010G (1)
                      - systemInfo (1)
                      - basicSetting (2)
                      - portConfiguration (3)
                      - ringRedundancy (4)
                      - vlan (5)
                      - trafficPrioritization (6)
                      - multicastFiltering (7)
                      - snmp (8)
                      - security (9)
                      - warning (10)
                      - monitorandDiag (11)
                      - save (12)
                    - jetnet4510 (3)
                  - managedPOESwitch (3)
                  - jetBox (8)

5.4 Revision History

Edition	Date	Modifications
V2.8	Jun-2011	● Correct Index. ● Add UL information for installation and SFP Fiber transceiver.
V2.7	11-Nov. 2010	● Apply to the New Firmware V2.4 ● Update major feature description ● Remove product specification from the manual; please check the most up to date datasheet from Korenix Web. ● Add **802.1s Multiple Spanning Tree Protocol** description and configuration pages in Network Redundancy chapter. ● Modify Multiple Super Ring description in Network Redudancy chapter. ● Add **Private VLAN** description and configuration pages, new chapter in this version. ● Add **QinQ** description and configuration pages in VLAN chapter. ● Add extended LACP Long/Short Timeout description and configuration CLI in Port Turnking chapter.
V2.6	5-Feb,2010	Add DHCP relay agent function
V2.5	25-Jun,2009	Support SFP DDM function in port status and warning selection.
V2.4	1-Aug,2008	Add SFP order information
V2.3	18,July,2008	Change housing & add more information for UL 60950-1
V2.2	20 Jun,2008	Modify the Pin Failure description of warning.
V2.1	May 15, 2008	Modify Multiple Super Ring function Modify Rapid Dual Homing Modify IGMP function Add Time Synchronize Failure warning event Modify Private MIB ID
V2.0	Oct. 23, 2007	Modify System Time function Add GVRP function Add IGMP snooping V3 description Modify Rapid Super Ring function Add Force filtering function Add IEEE 802.1x function
V1.1	Jul. 23, 2007	Add DHCP server setting Add IGMP Query setting

		Add SNMP v3 setting Correct the incorrect wording and update the latest Web UI figures
V1.0	Mar. 1, 2007	Add Auto Ring Coupling figure and description. Modify VLAN description.

5.5 About Korenix

Less Time At Work! Fewer Budget on applications!

The Korenix business idea is to let you spend less time at work and fewer budget on your applications. Do you really want to go through all the troubles but still end up with low quality products and lousy services? Definitely not! This is why you need Korenix. Korenix offers complete product selection that fulfills all your needs for applications. We provide easier, faster, tailor-made services, and more reliable solutions. In Korenix, there is no need to compromise. Korenix takes care of everything for you!

Fusion of Outstandings

You can end your searching here. Korenix Technology is your one-stop supply center for industrial communications and networking products. Korenix Technology is established by a group of professionals with more than 10 year experience in the arenas of industrial control, data communications and industrial networking applications. Korenix Technology is well-positioned to fulfill your needs and demands by providing a great variety of tailor-made products and services. Korenix's industrial-grade products also come with quality services. No more searching, and no more worries. Korenix Technology stands by you all the way through.

Core Strength---Competitive Price and Quality

With our work experience and in-depth know-how of industrial communications and networking, Korenix Technology is able to combine Asia's research / development ability with competitive production cost and with quality service and support.

Global Sales Strategy

Korenix's global sales strategy focuses on establishing and developing trustworthy relationships with value added distributors and channel partners, and assisting OEM distributors to promote their own brands. Korenix supplies products to match local market requirements of design, quality, sales, marketing and customer services, allowing Korenix and distributors to create and enjoy profits together.

Quality Services

KoreCARE--- KoreCARE is Korenix Technology's global service center, where our professional staffs are ready to solve your problems at any time and in real-time. All of Korenix's products have passed ISO-9000/EMI/CE/FCC/UL certifications, fully satisfying your demands for product quality under critical industrial environments. Korenix global service center's e-mail is koreCARE@korenix.com

5 Years Warranty

Each of Korenix's product line is designed, produced, and tested with high industrial standard. Korenix warrants that the Product(s) shall be free from defects in materials and workmanship for a period of five (5) years from the date of delivery provided that the Product was properly installed and used. This warranty is voided if defects, malfunctions or failures of the warranted Product are caused by damage resulting from force measure (such as floods, fire, etc.), environmental and atmospheric disturbances, other external forces such as power line disturbances, host computer malfunction, plugging the board in under power, or incorrect cabling; or the warranted Product is misused, abused, or operated, altered and repaired in an unauthorized or improper way

Business service : sales@korenix.com

Customer service: koreCARE@korenix.com